Library Classification Theory

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COURSE-3 : LIBRARY CLASSIFICATION THEORY

The basic objectives of any classification is to group like things and separate unlike things. Library classification has a unique feature of fitting the hierarchy of classes with a notation that helps in fixing the filiatory sequence among different classes within and among the subjects. A systematic arrangement of documents in most helpful manner in libraries and information centres requires classification. Librarians use classification systems to arrange documents in an order convenient to the user community. If documents are not classified in proper way, disorder will prevail and confusion will arise. The readers will find it difficult to locate the desired books. Hence, Library Classification is necessary for systematic orgnisation and efficient arrangement of documents on the shelves so as to facilitate the maximum use of them by the user community.

The theory of classification is a vast subject and the topics included in the syllabus for Library Classification Theory of Bachelor of Library and Information Science (BLISc) Programme by Dr. B.R Ambedkar Open University covers only such topics, which will enable you to understand the principles of book classification. The specific objectives of the Course are :

- to introduce you to the meaning, purpose and theories of library classification
- to give an understanding about the sound scientific principles and postulates underlying the principles and theory of classification.
- to explain how a proper notation system will help for the mechanised arrangement of documents in libraries and for construction of a call number
- to introduce you to the various schemes of library classification, and
- to provide an overview of the trends and developments in library classification.

The topics in this Course cover the core area of the subject. For the sake of convenience the syllabus has been divided into blocks and each block has been divided further into Units. Each Unit generally covers a specific area of the subject. The course material prepared in 1985 as Library Classification and Cataloguing Theory was bifurcated into two individual courses and revised in 1993. In 2002 the course units are revised and reorganised into four blocks with 16 units.

The Course units are prepared by specialists in accordance with the framed Syllabus as to enable you to read and understand them without much difficulty. Each Unit begins with contents list, followed by aims and objectives and a brief introduction to the contents. The contents of the Units is divided into sub-themes and they are numbered upto three levels for easy reference. Each Unit ends up with Summing Up, Glossary, Assignments, Model Answers and Recommended Books, Glossary and Model Examination Questions

The University hopes that the course material will help you get yourself acquainted with the contents of Course-03: Library Classification Theory. The Counselling-cum-contact sessions offered to you at the Study Centre will help you to get clarification of you doubts.

CONTENTS

BLOCK - I : THEORY OF CLASSIFICATION

This block introduces you to the theory of library classificaiton. Classification is concerned with the systematic organisation of knowledge embodied in documents. You should understand the genesis, growth and structure of knowledge to be able to design and apply classification schemes. Knowledge generated is communicated through various types of documents, both macro and micro. In Unit-1 the growth and structure of knowledge are briefly discussed.

In well organised and efficiently arranged libraries and documentation/information centres, documents are arranged in a systematic manner to achieve the most helpful sequence and to facilitate the maximum use of them by the user community. Systematic arrangement means the arrangement of documents on the basis of their thought/subject content. Library classification is a technique used by libraries for arranging the documents on the basis of their thought content.

Systematic arrangement of documents is possible only through classification. Therefore, the need and purpose of library classification is examined in Unit-2. To use library classification schemes effectively, you must know the general theory of library classification. In Unit-3 you will find the general theory of library classification expounded by distinguished classificationists.

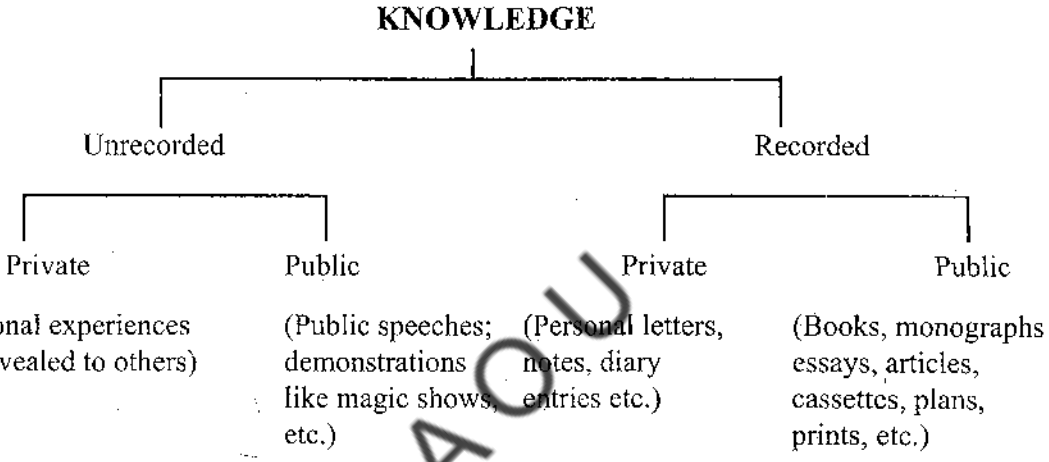
During the past twelve decades several schemes of classification have come to be designed and published. These schemes have certain characteristics. On the basis of these common characteristics the classification schemes can be grouped under various species or types. Unit-4 presents the various species and schemes of library of classification.

knowledge. That which we write in our personal diaries we do not want others to see or know. That is our private knowledge. Our spiritual experience or knowledge about God either as a theist or atheist is our individual private knowledge.

But that which we speak out in public, write or print and circulate with the hope that others would share our knowledge is public knowledge. Private and public knowledge are also known, as 'subjective' and 'objective' knowledge respectively. That which is an individual subject's personal knowledge is subjective knowledge. Knowledge which has no such limitation is objective knowledge.

Knowledge can be recorded in the form of manuscripts, books, musical records, microfilms, plans, maps, drawings, etc., or can be unwritten or oral. So we can also classify knowledge as recorded knowledge and unrecorded knowledge.

Now you look at the diagram below and try to understand what it means.



You have some idea of what a library is ? What type of knowledge do you find in a library ? The answer is simple. In a library we find only recorded knowledge; that too public recorded knowledge. Sometimes, however, a library may also have personal letters and diaries of great people provided that they are made public and available to the library as historical documents.

Self-Check Exercise-1

(a) State in two lines the basic characteristics of knowledge.

Note : i) Write your answer in the space provided below.

ii) Compare your answer with the model answer given at the end of this unit.

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(b) Mention the two major categories of knowledge.

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1.2.4 Knowledge and Libraries

Libraries and information centres store information and knowledge available in public records. The essence of the library and information service is selection, acquisition, processing, preservation and dissemination of public recorded knowledge available in documents. The acquired documents are therefore technically processed through classification and cataloguing for effective dissemination of information contained in them.

In library terminology the one who classifies the documents is called 'classifier' and the one who prepares a scheme of classification which can be used purposefully for classifying documents is called 'classificationist'. Both classifier and classificationist, therefore, should have some idea of the growth of knowledge; the modes of formation of subjects and the universe of subjects; and also the structure of subjects.

There are several schemes of library classification. Some schemes arrange the names of the subjects in a logical order and give them the symbolic notation. They are known as 'Enumeratives schemes' of classification because they enumerate or list all the subjects. Such schemes need revisions whenever new subjects come into existence.

Certain other schemes make an analysis of how subjects are formed. When the subject of a document is to be classified, first it is analysed so as to know how it is formed as a combination of different idea and then symbols appropriate to it are synthesized to give the document its final notation known as class number. These schemes are known as 'Analytico-synthetic schemes'.

Ranganathan contributed a great deal to the concept of analytico-synthetic scheme. He called the unit ideas or concepts as 'Isolates'. Isolates are arranged into facets on the basis of their common characteristics known as categories. He found our formulas for the combination of these facets.

In the following sections you will be knowing more about these ideas. Now it is sufficient for you to understand the various modes of formation of subjects.

1.3 GROWTH OF KNOWLEDGE

1.3.1 Universe of Subjects

In 1.2.2 we have seen that knowledge is dynamic and continuous. So our knowledge of any particular area or aspect of human effort grows. Our curiosity makes us think more and more about certain problems and improve our knowledge in that area. Accumulated knowledge in a particular area of human awareness, experience, investigation, etc., is called a subject.

You are familiar with the word, 'subject' right from your early school days. In schools, colleges and universities several subjects are taught. We also ask questions like which of the subjects do you find interesting'?

In dictionaries you might have seen that the same word may have two, three or even more meanings. *The Concise Oxford Dictionary* (1990), for example, gives one of the meanings for knowledge as 'the sum of what is known (every branch of knowledge)'. *The New Hamlyn Encyclopedic World Dictionary* (1988) similarly says that knowledge would mean the 'familiarity or conversance, as with a particular subject, branch of learning, etc.'

When we try to understand things and improve our knowledge and skills, we will naturally do so through the study of several subjects. The totality of subjects is called universe of subjects'. Sometimes we also use the word 'universe of knowledge', by which we mean that total knowledge available to humanity at any one particular point of time.

'The Universe of Knowledge' is ever changing. That is why we can speak of the totality of knowledge only in the context of time.

1.3.2 Formation of Subjects

We hear about new subjects coming up for study every now and then. It is in the very nature of knowledge (as can be seen from 1.2.2) to generate new knowledge and thereby new subjects. Ranganathan methodically studied the modes of formation of subjects around 1950. He could identify four modes at that time and enunciated them at the conference on Bibliographic Organisation organised by Graduate School of Library Science, University of Chicago (USA). The modes enunciated then were : 1. Denudation, 2. Dissection, 3. Lamination and 4. Loose Assemblage. Subsequently, two more modes of formation, viz. 'Distillation' and 'Fusion' were added. The exposition of these six modes led to systematic studies in the modes of formation of subjects at the Documentation Research and Training Centre (DRTC), Bangalore. In 1973 A. Neelameghan of DRTC rationalised these studies and brought in more clarity and depth.

The modes of formation of subjects as could so far be identified are stated below:

1. Lamination
   - 1.1 Lamination (kind 1)
   - 1.2 Lamination (kind 2)
2. Loose Assemblage
   - 2.1 Loose Assemblage (kind 1)
   - 2.2 Loose Assemblage (kind 2)
   - 2.3 Loose Assemblage (kind 3)
3. Fission
   - 3.1 Dissection
   - 3.2 Denudation
4. Fusion
5. Distillation
6. Agglomeration (in the beginning, the term, partial comprehension' was used for this)
7. Cluster (earlier known as 'subject bundle')

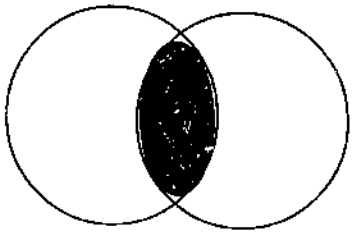
(1) LAMINATION

The word 'Lamination', is derived from the Latin word 'Laminae' which means thin separable layer. You might have seen laminated tables, chairs and doors. In the case of a laminated table a thin layer of sheet of glazed wood is fixed. The thin layer and the wooden table can be separated if we so desire.

Ranganathan identified two kinds of lamination in the case of formation of subjects.

Lamination - Kind 1

In this mode 'one or more isolate facets are combined with a basic subject (BS)'. The result is a compound subject. The schematic representaiton of lamination will look like :



Examples :

1. Library Science (BS) :	Public Library (I)
	Reference Service (I)
2. Education (BS) :	Secondary (I) : Examination (I)
3. Medicine (BS) :	Lungs (I) : Disease (I)

Note : (BS) means Basic Subject, (I) means Isolate.

Lamination - Kind 2

In this mode either (1). "two or more species of basic subjects going with the same primary basic subject are compounded over one another giving rise to compound basic subject or (2). "Two or more isolates from the same schedule of isolates are compounded giving rise to the compound isolates".

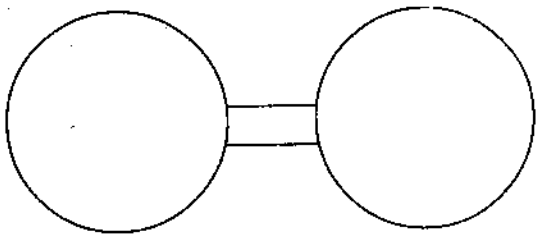
Examples :

1. 'Quantum theory of mechanics' is a compound basic subject got by the combination of the Basic Subject 'Mechanics' with the Basic Subject 'Quantum Theory'.
2. 'Rural working class' is a compound isolate got by combining isolate idea 'working class' with the idea 'Rural'.

(2) LOOSE ASSEMBLAGE

Loose Assemblage is the case where two or more subjects and/or isolates are studied in their mutual relation, resulting in a complex subject, a complex isolate idea, or a complex array isolate idea. We have seen that in lamination two or more isolate facets are compound over a basic subject to form a thin separable layer. For *example* : Cartoon Cinema. In Loose Assemblage relationships are studied. For *example* : Difference between Pop Music and Folk songs; Comparison between Islam and Buddhism etc. Six types of such relationships are identified. They are : 1. General, 2. Bias, 3. Comparison, 4. Difference, 5. Influence, 6. Tool (i.e., one subject may be used as a tool for the study of another subject).

Diagramatically represented Loose Assemblage appears something like the figure below :



Levels of Relation

The above six relations can be at three levels, namely;

(i) at the Subject level known as 'Inter-Subject Phase' relation or simply Intra-Subject relation'.

(ii) at the Facet level known as 'Intra-Facet relation', and

(iii) at the Array level known as 'Intra-Array relation'.

Now let us see what we mean by these statements. When two or more basic subjects (simple or compound) are studied in any of the six types of mutual relations stated in Section 1.3.2, it is considered as 'Intra-subject' or 'Inter-subject phase relation'.

When two or more facets of one and the same schedule are studied in any of the six types of relations stated above it is called 'Intra-Facet relation'.

Similarly, when two or more isolates of the same array (except the array of the first order) are considered in their mutual relation it is known as 'Intra-Array relation'.

Since Loose Assemblage can be at these three levels it is considered to be of three kinds.

LOOSE ASSEMBLAGE (Kind 1)

In this kind "two or more subjects - single or compound - are studied in their mutual relation". That is to say the Inter-subject phase relation.

General

1. Relationship between Political Science and Public Administration
2. Relationship between Physics and Chemistry

Bias

1. Mathematics for Engineers
2. Psychology for Doctors

Comparison

1. Comparative study of Botany and Zoology
2. Comparative Study of Religion and Philosophy

Difference

1. Difference between Public Administration and Business Management
2. Difference between Botany and Agriculture

Influence

1. Influence of Politics on Education
2. Influence of Economic conditions on society

Tool

1. Applicaiton of statistical methods in library science
2. Application of clinical methods in Psychology

LOOSE ASSEMBLAGE (Kind 2)

In this mode "two or more isolate ideas from one and the same schedule are brought into mutual relation". Such a relation is called "Intra-Facet Phase Relation". It gives rise to a complex isolate (kind 1).

The following are some examples of this mode of formation of subject :

General

1. Relationship between Social and Political Ethics
2. Relationship between Jainism and Buddhism

Bias

1. Clinical diagnosis for treatment of diseases
2. Vocational educaiton for females

Comparison

1. Comparative study of Hinduism and Sikhism
2. Comparative study of Public and Academic Library Systems

Influence

1. Influence of Classification on Reference Service
2. Influence of Hindu Philosophy on Buddhistic Philosophy

LOOSE ASSEMBLAGE (Kind 3)

In this mode "two or more isolates taken from one and the same array of order higher than 1 in one and the same schedule are brought into mutual relation. This type of relation is called "Intra-Array Phase relation". It gives rise to complex isolate kind 2. The following are some of the examples.

General

1. Relationship between Sankhya and Yoga Philosophies
2. Relationship between Deductive and Inductive Logic

Bias

1. Trade Survey for future marketing
2. The bias of middle class towards the newly rich class

Comparison

1. Comparative study of rural and urban societies
2. Comparative study of Classification and Cataloguing

Difference

1. Difference between Export and Import duties
2. Difference between Audio and Visual Education

Influence

1. Influence of Classification on Cataloguing.
2. Influence of Lok Sabha on Rajya Sabha in India.

The above illustrations give you only a general idea of what we mean in library classification by 'Phase Relation'. In Block II Unit 9 : Phase Relations, you will be knowing further details about this aspect.

(3) Fission

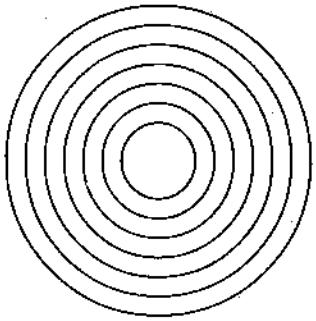
In this mode a basic subject or an isolate is split into subdivisions. Subject specialists call this fragmentation. The Dictionary meaning of fission is "splitting or breaking up into parts".

In a way Dissection and Denudation, the two of the four modes identified in the beginning, can be listed now under 'fission'. Dissection and Denudation can take place for both basic subjects and isolate ideas.

(a) Denundation

Denudation means taking out the outer layers one after another. A good example of it is what we see when an onion is denuded by removing layer after layer. At every stage it is still considered an onion. Similarly, when a basic subject or an isolate idea on denudation becomes a subject such a mode of formation we call 'Denudation'.

In the words of J.H. Shera, Denudation is 'the exposure of a new area of knowledge by erosion or divestment through research and enquiry'. A diagramatic representation of denudaiton will look like as given below :

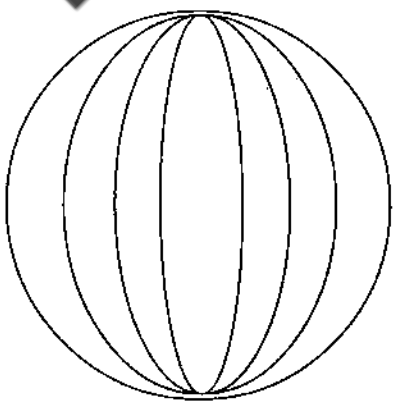


As an example let us take Mathematics. In the above illustration the largest enclosed area represents the basic subject, 'Mathematics' and the smaller enclosed areas stand for Algebra, Geometry, Trigonometry, etc.

(b) Dissection

Dissection is cutting the universe of entities into parts of co-ordinate status. By 'coordinate status' we mean that each one of the entities stands independent of the other. This mode of formation may be compared to the peeling of an orange inside which we get a number of pips. These pips are similar in nature. They are coordinate to each other. Each pip can be further dissected where we get numerous minute pips. In the language of library classification they form an array. Dissection is one of the methods of formation of basic subjects and isolate ideas.

In a diagramatic representation, dissection looks as shown here under :



If we dissect Science, we get Mathematics, Physics, Chemistry etc. Similarly, if we dissect Educaiton we get 'Kindergarten'. Primary, Secondary, Higher Education etc.

Fission can be of Basic Subjects as in the case of the which is Physics, being fragmented or fissioned into 'Matter', 'Sound', 'Heat', 'Light', 'Electricity', 'Magnetism', etc.

(4) FUSION

When two or more things blend themselves into one single thing losing their identities we call it 'fusion'. In this mode "two or more primary Basic Subjects are fused in such a way that each of them loses its individuality with respect to schedule of isolates needed to form the compound subjects going with it". This gives rise to a new primary basic subject.

Examples :

1. Biochemistry (this primary basic subject is got by the fusing of primary basic subjects, Biology and Chemistry).
2. Geophysics (this is achieved by the fusion of Geology and Physics)

(5) DISTILLATION

In this mode of subject formation "a Pure Discipline is evolved as primary Basic Subject from its appearance in action in diverse compound subjects going with either different basic subjects or one and the same basic subject". This mode gives rise to primary Basic Subjects.

Examples :

Management Science

Research Methodology

These subjects are distilled subjects because they can be applied to any subject. For example, Hotel Management, Travel Management, Library Management, Research Methods for Engineers, Research Methods for Social Workers etc.

(6) AGGLOMERATION

For 'Agglomeration' Ranganathan earlier used the term, 'Partial Comprehension'. Agglomeration means rolling together or winding together. In the context of subject formation agglomeration means a new subject that rolls into it, more than one subject in a rounded manner. These are broad subject areas which are studied as subjects.

Examples :

Humanities

Social Sciences

Physical Sciences

Biological Sciences

(7) CLUSTER

Earlier, the term 'Subject Bundle' was used for this. 'Cluster' literally means 'a group of similar things'. In the case of certain specialist studies all information on and about a subject is grouped together or brought together. This requires inter-disciplinary or multi disciplinary research

1. Area studies like Indology (i.e. every thing about Indian history, culture and tradition); Sinology (about China); Egyptology (about Egypt).
2. Studies about a person of great prominence like Gandhian Studies; Nehru Studies.
3. Study of an entity or phenomen forming the focus of the cluster.

Examples :

1. Soil Science (here soil is the focus of the cluster of studies)

   Similarly, 2. Space Science, and 3. Ocean Science.

Self-Check Exercise-2

(a) List out the different modes of formation of subjects.

Note : i) Write your answer in the space given below.

ii) Compare your answer with the answer given at the end of this unit.

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(b) Differentiate between Denudation and Dissection.

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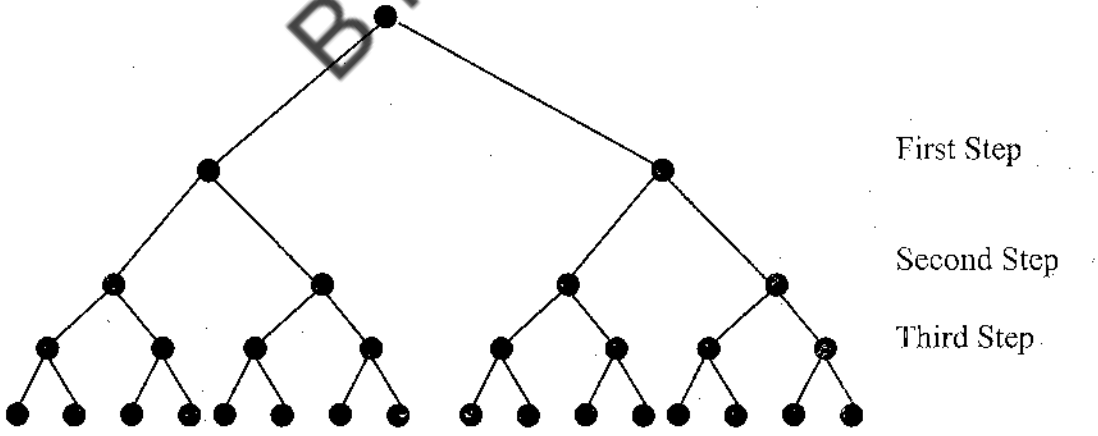
1.4 STRUCTURE OF SUBJECTS

In the preceding sections the different modes of formation of subjects are considered. When a scheme of library classification is to be designed we must also take into consideration the structure of subjects. That is to say, the question of how the total universe of subjects can be grouped together for the purpose of classification needs to be studied. Some of these aspects are described briefly below.

1.4.1 Dichotomy

'Dichotomy' means division into two. This is also known as 'Binary Classification'. In this two divisions are formed in the first stage. Again, two divisions of each of these divisions are formed in the second stage. The process continues like that. See the diagram below for better understanding of 'dichotomy'.



This binary classification at every stage is called 'Tree of Porphyry'.

A great philosopher, Kant, of the 18th century attempted to classify the universe of subjects by this method but realised that it was possible to restrict the division to two at every stage. 'Dichotomy' is not helpful to the designing of any scheme of classification for the universe of subjects.

1.4.2 Decachotomy

Having realised the usefulness of decimal notation, division into ten at every stage was thought to be helpful to subject classification by Melvil Dewey. Such a division into ten at

every step is known as 'decachotomy'. Dewey Decimal Classification used this successfully. Look at the example given below :

Step-1	Step-2	Step-3
Generalia	**Sciences**	**Physics**
Philosophy	Mathematics	Mechanics
Religion	Astronomy	Fluids
Social Science	Physics	Gases
Languages	Chemistry	Sound
Sciences	Earth Sciences	Light
Technology	Paleontology	Heat
The Arts	Life Sciences	Electricity
Literature	Botanial Sciences	Magnetism
Geography & History	Zological Sciences	Modern Physics

But Decachotomy also has some disadvantages. If a subject grows further into more than ten subjects all of them have to be accomodated only within the ten divisions.

1.4.3 Polychotomy

'Polychotomy' means division into many. The process of division of the universe of subjects into two or ten divisions at each and every step is arbitrary and unhelpful. You can easily understand why the Universe of Knowledge is dynamic and multifaceted. It grows in different directions at different times giving rise to several subjects continuously.

The number of divisions to be incorporated in the schemes of library classification at a given stage is difficult to determine. The number of subjects at any stage should be identified and listed in the schemes for library classification. Colon Classification 7th edition was published in 1987. You will know in detail about this scheme under Block IV; Unit 18.

Self-Check Exercise-3

(a) Why dichotomy is not helpful to the designing of a scheme of classification ?

Note : i) Write your answer in the space given below.
ii) Compare your answer with the model answer given at the end of this unit.

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(b) Decachotomy is successfully used in

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1.5 SUMMING UP

Library classification helps in arranging documents in a helpful way. Documents contain information and knowledge. Terms like 'Knowledge', 'Information', 'Wisdom' are difficult to define. Knowledge has certain characteristics. It is primarily based on sensory experiences like taste, smell, touch, sight and hearing. Repeated experiences result in knowledge. Knowledge

can be broadly classified as 'public knowledge' and 'private knowledge'. It can also be classified as recorded and unrecorded knowledge. Since libraries are repositories of documents we can say that libraries are concerned with public recorded knowledge. Another aspect of knowledge is that it is dynamic and continuous and so the universe of knowledge multiplies into several subjects.

A scheme of classification by means of which documents are classified is, therefore, concerned with the growth and structure of knowledge. Ranganathan could identify four different modes of formation of subjects around 1950. On further research Ranganathan and his associates found out that there are several other modes of formation of subjects. In order to group the universe of subjects for purposes of classification different means of division are available. Dividing the whole into two at every stage of division (known as dichotomy) or into ten divisions at every stage (decachotomy) or into several divisions (polychotomy) are some of the methods.

Library classification schemes attempt continuously to find solutions to the tackling of the ever changing, continuous and multifaceted growth of knowledge.

1.6 MODEL ANSWERS

1. (a) Knowledge is multidimensional, continuous, infinite and dynamic.
   (b) Subject knowledge and objective knowledge.
2. (a) Lamination, Loose Assemblage, Fission, Fusion, Distillation, Agglomeration and Cluster.
   (b) Denudation is the exposure of a new area knowledge through research. Dissection leads to the identification of isolates of coordinate status.
3. (a) It is not possible to restrict the division into two every stage.
   (b) Dewey Decimal Classification

1.7 ASSIGNMENTS

1. Briefly explain the modes of formation of subjects. Illustrate your answer with suitable examples.
2. Explain how understaing of the structure of knowledge is important for the librarian.

1.8 RECOMMENDED BOOKS

Gopinath, M.A. *Classification Research (India)* 1968-73 (FID/CR Report No. 14) Bangalore : DRTC, 1974. (Chapter G)

Kaula, P.N. *Ranganathan Memorial Lectures* (2) (1974). Ujjain : Dept. of Library Science, Vikram University, 1974.

Krishan Kumar. *Theory of Classification.* New Delhi : Vikas Publishing House, 1983.

Ranganathan, *S.R. Prolegomena to library classification.* Bombay : Asia Publishing House, 1967.

Sharma, Pandey S.K. *Universe of Knowledge and Research Methodology.* Delhi : Ken Publications, 1990.

1.9 GLOSSARY

Knowledge : (1) Awareness or change in mental capacity perceived through sense organs.

(2) Collective wisdom as available in different types of documents.

Isolate	:	Unit idea or concept
Lamination	:	Binding together in seperabel layers
Loose Assemblage	:	Two or more unbound or unabated subjects and / or isolates studied in mutual relation.
Fission	:	Splitting of one subject into two roughly equal parts.
Fusion	:	A close union of two subjects

1.10 MODEL EXAMINATION QUESTIONS

I. ESSAY QUESTIONS

1) Discuss the Formation of Subjects with suitable examples.

2) Explain the structure of subjects with examples.

II. SHORT NOTES

a) Qualities of Knowledge

b) Loose Assemblage

UNIT-2 : NEED AND PURPOSE OF LIBRARY CLASSIFICATION

Contents

2.0 AIMS AND OBJECTIVES

In Unit-1 you have seen how knowledge grows and subjects develop. In this Unit the evolution of the records of knowledge and the need for their arrangement in a helpful manner will be discussed. The different approaches of users to library documents and the need for classification will be explained.

On studying this unit, you should be able to

- describe the nature of documents;
- explain the need for organisation of documents on library shelves and the problems they pose; and
- explain the term 'library classification' and its functions.

2.1 INTRODUCTION

The invention of writing and writing materials is a great turning point in human history. The story of its evolution is interesting. With the advent of this invention records of information began multiplying. Now we find a variety of documents in different physical forms. In order that the society may be benefited these records need to be preserved and organised in a helpful sequence in libraries and information centres.

The library's collection should be used to the maximum. Users who come to a library may ask for a document written by a known author; or a document by a particular title; or a document on a particular subject. The subject approach is a prominent approach to the searching of a document in the library. A library has to take into consideration the different aspects of the user needs and find a helpful way of arranging documents.

Library classification helps the organisation of documents in a library. The term 'Library Classification' has been defined in different ways. There are several functions which library classification performs. It has several advantages also. You will now study all these aspects in the Sections that follow.

2.2 RECORDS OF KNOWLEDGE

Invention of writing is one of the greatest achievements of human civilization. Long long ago our ancestors conveyed messages through gestures, sounds, colour beads, symbols and pictures. Pictures of animals, birds and things seen in nature like Sun, Moon and the like were drawn to convey ideas. In this process of evolution of communication the alphabetic writing came to be invented eventually.

The writing materials also changed. Early writings were on cave walls, barks of trees, stones, clay tablets, skins and hides of animals, cloth and later a sheet made out of a water plant known as Papyrus. This led to the invention of modern paper. Similarly, the modern ball point pen was preceded by several writing instruments like a sharp edged stone, metallic stylus, quills and brushes and ink pens.

At present informaiton and knowledge can be found recorded not only in the traditional books, manuscripts and journals but in several other forms. Sound recordings like gramophone records, audio-cassettes and digital records; visual recordings like pictures, maps, atlases, models; and audio-visual records like motion picture films and audiovisual cassettes store information. The list of records where we can store information or from which information can be retrieved is very long. All these are important sources of knowledge.

For a long time we have been speaking of books only when we think of libraries. But now we consider the various types of information records stated above are useful sources of knowledge. In order to distinguish the term, "book", from these records we have been using the term, 'document'.

With the increase in the variety of these different types of documents we have started differentiating books from other types by calling them 'non-book materials', 'Non-conventional documents', 'Non-traditional documents'; 'special materials' are some of the terms used for them. For the sake of convenience, we use the term 'document' for any type of record which stores information.

2.3 NATURE OF DOCUMENTS

In its external appearance a document may be a book, periodical, manuscript, map, patent, video-cassette, gramophone record or any such other mentioned. In its internal form the document contains information on a single subject or on several subjects. There may be several documents

on the same subject written normally by different authors. Again, a document may be the outcome of the creativity or the effort of a single author or several authors. The lessons in this course, for example, though they appear to you as a single document are prepared by several persons.

A document has another feature also. Every document is related to one or more documents. If there are several documents written on the same subject they are related in so for as their subject content is concerned. And also if a document deals with interdisciplinary subjects it is naturally related to the subjects dealt with by it. For example, a document like 'Statistics for Engineers' is related to both the subjects, 'Statistics' and 'Engineering'.

2.4 COLLECTION AND PRESERVATION OF DOCUMENTS

As knowledge grows the need for collection and preservation of documents increases. There are at least two reasons which we can immediately think of. Firstly, new knowledge always germinates from the existing knowledge. So, any person should first of all have access to the existing knowledge which means that documents are to be collected and preserved. Secondly, if the available knowledge is preserved then probable duplication of research can be avoided.

Collection and preservation of human knowledge is also essential for furtherance of culture and socio-economic development. In ancient times clay tablets, parchment and papyrus rolls were maintained to keep law codes for posterity. *Hammurabi's law codes* were maintained like that. Even in our country you know that king Ashoka's edicts were recorded on stone pillars.

2.5 ORGANISATION OF DOCUMENTS

Once the value of storage and preservation of knowledge in the form of documents is realised the number of documents would swell. Earlier, they were of one or two types like clay tablets and copper plates. In modern times they include a wide variety as stated in Section 2.3.

2.5.1 Need for Organisation

As the number and variety increases documents need systematic arrangement. Such an arrangement is for two purposes: One is for keeping them in an orderly manner and the other for retrieving or picking them up easily whenever we want informaiton from them. Such an arrangement for storage as well as for retrieval is what we call 'organization'.

Libraries and informaiton centres take the responsibility for the organization of documents. As social organisations, libraries act as mediators between documents and their users. Ranganathan's "Five Laws of Library Science" insist that every reader should be provided with his or her document and that every document should reach its reader. Optimum use of library collection by its users is the guiding principle for modern libraries. The right document to the right user at the right time shall be the motto for the library and information service. To achieve this, documents should be well organized in the libraries.

2.5.2 Arrangement of Documents

Documents are arranged in the olden days on the principle of fixed location. In such a system the location of each document is fixed and permanent. New documents were arranged in a sequence one after another as and when they were acquired. In a way it was a primitive method. If one were to find related documents on the same subject one had to rummage through the whole collection. Related subjects also got separated. It was difficult to find the total number of documents available in the library on a particular subject.

Such a pratice of arranging books marked by a fixed location may be alright if the number of documents is small. But for a large number of documents it is unhelpful and unscientific too.

Other methods, followed for arrangement of documents in those days, were by the external features of the documents like size, colour of the binding, year of publication, nature of binding, accession order etc. None of these arrangements are helpful to the user in modern times.

2.5.3 Problems of Arrangement

We have seen in the above section that neither fixed location nor extrinsic (external) features of the documents can be of much help in the arrangement of documents. These methods are unhelpful because (i) the number of documents is ever on the increase, (ii) knowledge or information can be found in a wide variety of physical forms of the documents.

There are some other problems which complicate the arrangement of documents. For example, documents are written in several languages. On the same subject there may be documents in different languages. Documents themselves are complex in nature. A 'Document' may be written on a specific subject or on several subjects. A subject may be treated for children at their level in one document; for youth in another document; for a layman in a third document and for a scholar in another.

Complexity in the nature of documents can also be found in the way in which it is produced; for example, a document in several volumes or in a single volume; or in the form of a periodical or as a serial.

Added to this, the users themselves seek the documents for different purposes. It may be for pleasure; for relaxation; for serious research; for improving one's knowledge; for keeping oneself up-to-date; for decision making and so on. If we take into consideration all these aspects for arranging documents in a library then it will be of real help to the users.

The problems that need consideration for a helpful arrangement of documents can be listed as follows :

i) Increase in the number of documents from time to time (This is known as 'knowledge explosion').

ii) Multiplicity of languages in which documents are written;

iii) Numerous forms in which documents are produced;

iv) Nature and complexity of documents;

v) Complexities in the production of documents;

vi) Complexity in the approach of users to the documents.

A Comprehensive solution to all these problems has not yet been found.

2.5.4 Factors Determining the Arrangement

However, when documents are to be arranged some essential and useful factors may be taken into consideration. J. Mills in his work *A Modern Outline of Library Classification* listed the following factors for determining the sequence of documents :

1. **Age of the user :** Children's books are to be distinguished from books for others;
2. **Use of material :** Documents for lending purpose are distinguished from those which are to be consulted within the four walls of the library;
3. **Documents of unusual size :** Documents of abnormal size i.e., oversize and under size documents are to be shelved separately. Such a practice will conserve space on regular shelves of the stack area;
4. **Documents of unusual gross body :** Micro-cards; gramophone records, tapes, slides etc., are to be shelved separately;
5. **Thought content of the documents** (Subject matter) **:** Generally *Belles lettres*

are arranged in terms of author, language or literary form; while Non-fiction is arranged by subject;

6. **Language of the document :** Books in different languages are arranged separately under the languages concerned;

7. **Value of the documents :** Rare books which cannot be acquired easily, or which are costly and precious are arranged separately;

8. **Form of presentation :** Because of their peculiar form of presentation periodicals are arranged separately after the volume is completed and bound;

9. **Date of printing :** 'Incunabula' i.e., early printed books (books printed before 1500) are separately shelved;

10. **Local History Collection :** Because of the nature of collection which gives local emphasis, documents of this nature are arranged separately. By 'local history collection' we mean documents on a region or a locality where the library is operative. Such documents include documents published in the region; written by the authors of the region; written about the region; written by authors born and grew in that region, though later they might have migrated to other places.

It may be pointed out that though Mills has not listed it, 'Special collections' of books donated by philanthropists, scholars and famous personalities are also arranged separately in libraries.

The various factors stated above, no doubt, influence the arrangement of documents in the libraries. Even in respect of these separate arrangements, if arranged on the basis of subject matter of the documents, the library will be used to the maximum. Arrangement on the basis of subjects within each one of the different groups is known as 'Parallel sequences' in libraries.

2.6 USERS' APPROACHES

We have seen in the earlier sections that arrangement of books in ancient times was on the basis of fixed location or on and of factors like colour, size, accession sequence, year of publication, etc. Such arrangments are unhelpful to the user. The user of a library is a very important person (VIP) and libraries exist to serve them. All our training and acquisition of knowledge in library and information science are interested to provide the right document to the user at the right time.

So the arrangement of documents should meet the user needs. It has been observed that there are three prominent approaches of library users to the documents. They are Author, Title and Subject. A user is interested in finding a document by a particular author; or a particular title; or, on most of the occasions is interested in finding documents available in the library on a particular subject. We shall consider these approaches now.

2.6.1 Author Approach

Users would prefer this approach for two purposes : 1) When they want to use a document whose author's name is known; and 2) When they want to find out if some more documents by the author whose name they know are available in the library or not. This happens mostly in the case of fiction. Users are interested in finding out if any new titles of the author of their choice are added to the collection.

Arranging documents according to the names of the authors in an alphabetical order may be suitable for such an approach. But, such arrangement has disadvantages also. In such an arrangement books on different subjects not necessarily related to each other would come together. Secondly, in the name of the author is not known or forgotten at the time of the search it will be very difficult for the user to get his document.

2.6.2 Title Approach

Sometimes, a user may approach a library for a document known to him by its title. But just like the author approach the title approach also has certain disadvantages. The following are some of the disadvantages :

1. The user should be able to recall the exact title of the book, otherwise, if there were to be any variation the user cannot find the document; 2. Titles are very difficult to memorise accurately as compared to the names of authors; Only exceptions are striking and popular titles; 3. Chances are many for misquoting a title; 4. The title name may change from edition to edition for the same document; 5. The same document may appear under different titles in different countries by different publishers, though the language may be the same; 6. When the document is published in different languages the title of the same document may be different in different languages; 7. Title approach in arrangement of documents is not helpful to those users who seek the document under the author's approach or the subject approach; 8. The title arrangement fails to bring together documents on the same subject; and documents written by the same authors.

Because of these disadvantages the arrangement of documents on the basis of their titles is unhelpful and cannot be followed for large collections of documents.

2.6.3 Subject Approach

Now-a-days there are many new subjects which are emerging because of specialization. Within the same subject valuable information is being published in a large number of books, monographs, periodicals, etc. Particularly in science and technology a scientist will have to find out the available information in his area of research interest; Otherwise, a scientist will be wasting his time, money and energy and repeating the same piece of research that has already been done by another scientist.

Even, in educational institutions the class room learning has to be supplemented by consulting and studying documents on the subject. Therefore, libraries are approached by users to find documents on specific subjects. Only in the case of literature the users may perhaps approach library collection through author or title.

Arrangement of documents on the basis of subject helps to bring documents on the same subject and related subjects together or in close proximity. This is helpful especially, in open access libraries. By bringing together documents on the same subject such an arrangement will help the user find an alternative document on the subject if the one the user is liking for is not available. For example, if you are looking for a book on library classification theory by Ranganathan, in the vicinity you may find books on library classification theory by J. Mills, W.C.B. Sayers, etc. Along with these books you may also find books on other subject areas of library science., say for example, books on classification practice; cataloguing theory, documentation, etc.

Subject arrangement will show the user 1. What documents the library has on a particular subject; 2. What documents the library has on a subject related to the subject of enquiry; some times even the user may be surprised to know about new subjects related to his subject of interest. You may be looking for books on Buddhism and near that collection you will find books on Zen Buddhism. It may so happen that till that time you may not be knowing that there is a subject like Zen Buddhism.

Subject arrangement of documents is helpful not only in the general sections but also in other collections like Reference Section ; Text Book Section; Theses and Dissertations Section; Pamphlets Section etc. Such arrangements are known as parallel sequences (See Seciton 2.5.4. of this Unit)

Several experts feel that the organization of documents other than on the basis of subject may not meet the requirements of the majority of users in the modern libraries. Arrangement of documents by subject is most popular, helpful and convenient in the present day libraries. Classificationists like G.O. Kelly; H.E. Bliss, W.C.B Sayers; and S.R. Ranganathan and many others have advocated subject arrangement of documents. B.I. Palmer and A.J. Wells felt that in the specialist librarian's experience, the subject approach is most common. There may be few users who approach for a document through the name of the author or by the title. These approaches can be met by the library catalogue. Subject arrangement of documents is taken care of by the library classification.

Self-Check-Exercise-1

(a) State in two lines the need for organisation of documents in a library.

Note : i) Write your answer in the space given below.

ii) Compare your answer with model answer given at the end of this unit.

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(b) Name the different approaches of the library users to the documents.

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2.7 CLASSIFICAITON

The word 'Classification' comes from the Latin word, 'Classes', which means grouping. We observe grouping everywhere. It is said that "Order is the Heaven's first law". It is this divine instinct which prompted man since the dawn of civilization to assemble and arrange all things in nature including human ideas in a systematic manner.

Systematic grouping or classification lies at the base of well managed human activity. Our daily life depends very much on the process of classification, however, elementary it may appear. Arrangement of entries in Railway Time Tables, display of goods in a grocery shop, seating arrangement in a theatre or a stadium, assigning registration numbers to different vehicles, arrangement of money by denomination are some examples of classification in our daily life. Rather unconsciously we classify things or ideas very often.

In an ordinary sense, classification is essentially a mental process by which we bring like things or concepts together separating unlike things and concepts from them. This mental process of grouping or separating is called abstraction and such abstraction results in things or ideas being classified.

In fact, the term, 'Classification', is used in many senses. S.R. Ranganathan in his *Prolegomena to Library Classification* has defined it in five senses. They are :

Sense 1 : Division. A Child practises Classification in this sense with its play things. Early man also practiced classification through the process of division.

Sense 2 : Assortment : It means "the process of division of a universe into groups plus that of arranging groups in a definite sequence that is of making - that is assigning a rank to each resulting group". The activity of the philosophers and taxonomists in the field of classification is generally restricted to classification in sense 2.

Sense 3 : "Classification in sense 2 plus representing each entity by an ordinal number taken out of a system of ordinal numbers designed to mechanise the maintenance or sequence

1. Either when an entity has to be replaced after having been taken out of its position;
2. Or when a new entity has to be interpolated or extrapolated in the correct place in the sequence". Classification in this sense is made use of by large commercial and business firms having to handle large number of goods or commodities.

Sense 4 : "Classification in sense 3 when complete, assortment is made of an amplified universe, that is, when the entities and pseudo-entities arising in the process of successive assortment stand arranged in one filiatory sequence, each with its class number". It appears the classification in this sense is limited in use.

Sense 5 : "Classification in sense 4 with all entities removed but only the pseudo entities or classes retained - each class having the number representing it". Classification in this sense is what is practised by the library profession.

Thus we find the term, 'Classification', is a homonym. In the succeeding paras and sections the term is used in sense 5 which is practised in libraries for achieving helpful sequence for the arrangement of documents.

2.7.1 Library Classification

Library classification is concerned with the knowledge content of a document or, in other words, the subject of a document. In order to help the user find various documents on a particular subject and to bring together documents on closely related subjects in a filiatory sequence the library classification schemes have been worked out by classificationists.

The phrase, 'library classification', has been defined by several classificationists and writers on classification underlining its utilitarian aspect. Margaret Mann has defined it as the "arranging of things according to likeness and unlikeness. It is the sorting and grouping of things, but in addition, classification of books is a knowledge classification with adjustments made necessary by physical form of books". W.C.B. Sayers has defined it as "the arrangement of books on shelves, or descriptions of them, in the manner which is most helpful to those who read". According to A. Maltby, it means "systematic arrangement of subject of books and other materials on shelves... which is most useful to those who read or seek a definite piece of information".

According to Ranganathan, Library Classification "is the translation of the name of the subject into preferred artificial language of ordinal numbers, and the individualization of several books dealing with the same specific subject by means of a further set of ordinal numbers which represent some features of the books other than their thought content". This definition describes two steps - first books are separated on the basis of the subject and then different books on the same subject are separated and individualized further.

In libraries unless and until each document is identified by a specific number it will be difficult to identify and use the documents. The number given after the two stages of classification stated above is known as 'Call Number'. The Call Number consists of Class Number and the individual Book Number. In Section 2.5.4 we have observed that in libraries documents may sometimes be arranged in parallel sequences. So it is possible that two books may have the same Call Number (Class Number and Book Number) and are available in parallel sequences. To further individualize the books a symbol indicating the collection is also used to improve

the classification.

While class number is arrived at by the methods given by a scheme of classification the book number and collection number have to be given according to the practices of the individual libraries. Even in these cases also there are certain standard practices. Block III - Unit 12 gives you all the details concerning it.

2.7.2 Need and Purpose of Library Classification

In the earlier sections we have mentioned in brief the reasons as to why documents in a modern library are arranged according to the subjects on which they contain information. Later, we have tried to understand the terms, 'classification' and 'library classification'. Now, we shall try to consider the various reasons as to why we need library classification. The following are some of the reasons :

1. Library is a social institution and is a service organization. In order that the service may be useful and purposeful and documents are to be arranged systematically. The arrangement by subject is found to be more suitable than anyother. Hence there is a need for library classification.
2. 'Library is a growing organism' says Ranganathan in his Fifth law of Library Science. In order to cope with such a growth there should be library classification. If the number of documents in a library is small the users as well as the library staff can handle the collection without any difficulty. But when the collection is very large as in the case of modern libraries there should be a classificatory arrangement of the documents.
3. When documents are arranged according to any modern scheme of library classification the documents on related subjects appear side by side on the shelves. Such a display of subject relationship is known as "Collocation".
4. Library classification helps systematic shelf arrangement of different kinds of documents for different purposes. A user will be in a better position to consult and use the collection without the assistance of the library staff when documents are arranged so conveniently.
5. Library classification helps achieve the effective use of library collection. It also helps in making the maximum use of the library collection.
6. It saves the time of the user and thereby the time of the library staff also.
7. Library classification also helps in finding out the total collection available on a subject. Further, it helps us to know the strength and weakness of the collection in the library on any subject.
8. To be more specific, if Ranganathan's Five laws of Library Science, namely, (i) Documents are for use, (ii) Every reader his/her document, (iii) Every document its reader, (iv) Save the time of the reader, and (v) Library is a growing organism; were to be satisfied there should be library classification.

2.7.3 Functions of Library Classification

The functions of library classification may be summed up and stated as follows:

1. Library classification arranges documents in an order convenient to the user and the library staff.
2. It brings together documents on closely related subjects. This is known as filiatory sequence or collocation of the subjects.
3. Whatever might be the size of the library, classification finds a proper place for it

among the existing documents. This is known as 'relative location'.

4. When a new document is added to the library, classification finds a proper place for it among the existing documents. This is known as 'relative location'.
5. In effect, library classification mechanises the process of arrangement of documents on the shelves.
6. Library classification facilitates book displays and documents can be picked up from the main stocks for special occasions like seminars, symposia, book exhibitions, book talks on a given topic or at the time of specific functions.
7. Compilation of various kinds of statistics and preparation of annual reports become easy when there is library classification.
8. Efficient and thorough stock verification of the library collection is possible through the medium of shelf-list which is arranged on the basis of the library classification.
9. Library cooperation becomes easier when the cooperating libraries follow the same scheme of classification. Compilation of bibliographies, union catalogues, etc. can be done without much difficulty.
10. It helps the user of a dictionary catalogue to refer to the location of a specific document on the shelf (through the call number given in the catalogue entry).
11. If it is a classified catalogue, classification helps in filing entries in the classified part of the catalogue. It also helps in the deriving of "Class Index Entries" in the case of Ranganathan's Classified Catalogue.
12. It assists the classification of information, suggestions received from the users, and in attending to the reference queries to be answered at the Reference Section of the library.
13. It can also be used in the filing of non-book materials such as slides, films, microforms, AV materials, etc.
14. The complexities of the universe of knowledge and its growth patterns can be understood by the users as well as librarians through library classification.
15. To conclude : As Humle said "It is a mechanical time saving device for the discovery of knowledge in books". It is also the basis for organisation of subjects as embodied in documents for use. For efficient bibliographic organisation, control and retrieval of documents also classification is the basis.

Self-Check Exercise-2

Give at least three reasons why library classification is needed.

Note : i) Give your answer in the space provided below.

ii) Compare your answer with the model answer given at the end of this unit.

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2.8 SUMMING UP

With the invention of writing and writing materials information records began appearing in different forms and shapes in large numbers. For convenience, we are using the term, 'document', to cover the different types of information records like books, monographs, maps, microforms, audio-visual materials and the like.

The function of a modern library is to acquire, preserve and put to maximum use the various information records. Hence there is a need for the organisation of documents in a library. A helpful hint is that users have three different approaches towards documents, namely Author, Title and Subject approaches.

Library classification attempts to group the documents on the basis of their subjects. Library classification performs several functions. The need for library classification is established beyond doubt.

2.9 MODEL ANSWERS

1) (a) To keep the documents in an orderly manner and to retrieve the necessary information easily.

   (b) Author approach; Title approach and Subject approach.

2) (a) To arrange the documents in a systematic manner for purposeful use.

   (b) To bring together documents on related subjects.

   (c) To achieve optimum use of the library collection.

2.10 ASSIGNMENTS

1) Explain in ten lines what you understand about records of knowledge.
2) State the problems faced by librarians in the organization of documents.
3) Define classification in terms of Dr. S.R. Ranganathan.
4) Give at least five functions of library classification.

2.11 RECOMMENDED BOOKS

Datta, D.N. *Library Classification Manual.* Calcutta : World Press, 1978.

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2.12 GLOSSARY

Classification : A mental process by which like things or concepts brought together and unlike things or concepts separated from them.

Document : A record of information/knowledge available not only in the traditional books, manuscripts and journals, but also as sound records, gramophone records, microforms, maps, films etc.

Library Classification : A classification helps in the systematic arrangement of subject books and other (reading) materials on shelves of a library.

2.13 MODEL EXAMINATION QUESTIONS

I. ESSAY QUESTIONS

1) Discuss the various problems in organising the documents in various libraries? List out the various factors which help in determining the arrangement of documents.

2) What is library classification ? Discuss its need and purpose.

II. SHORT NOTES

a) Nature of documents

b) Subject Approach

UNIT-3 : GENERAL THEORY OF LIBRARY CLASSIFICATION

Contents

3.0 AIMS AND OBJECTIVES

Schemes for library classification are designed on the basis of certain principles. If these principles are found to be too elementary to help map the knowledge embodied in documents, new ones would come to be formulated by classificationists. In this Unit you will get an idea of the contributions made by classificationists like J.D. Brown, E.C. Richardson, E.W. Hulme, W.C.B. Sayers, H.E. Bliss and S.R. Ranganathan to the formulation of a general theory of library classification.

After studying this unit, you should be able to explain the theories of library classification formulated by Brown, Bliss, Richardson, Hulme, Sayers and Ranganathan.

3.1 INTRODUCTION

In the previous Units you have read about the growth and structure of knowledge and how new subjects evolve. You have also noted that libraries keep public recorded knowledge in the form of documents and that documents are of different kinds. In these Units the need for arranging these documents with the help of a scheme of library classification has been established.

Many philosophers have attempted to classify knowledge. Theoretically, classifying knowledge is much simpler than classifying knowledge when it is embodied in a document. A document may contain a discussion on science and religion, or religion and philosophy or even religion and politics. Some documents may be interdisciplinary in nature. In such cases where ultimately the document has to find a place among related documents the main problem of library classification has arisen. It is in this context several authors have tried to establish a theory of book classification which is essential for designing an efficient and durable practical scheme for library classification of documents in libraries and information centres.

By the end of the 19th century and the beginning of 20th century many stalwarts in the field of library classification have tried to enunciate their principles for classification. Some of the well known persons are J.D. Brown, E.C. Richardson, E.W. Hulme, W.C.B. Sayers, H.E. Bliss, and S.R. Ranganathan. In the following paras an attempt is made to explain the principles enunciated by these classificationists. Their views are presented in a brief manner.

3.2 JAMES DUFF BROWN

J.D. Brown's contribution to the general theory of classification is limited but significant. He brought out three different schemes of classification. The first one was in collaboration with J.H. Quinn and was known as 'Quinn-Brown Classification'. The scheme did not make much impact. Three years later, in 1897 Brown putforward another scheme known as 'Adjustable Classification'. By this time the Dewey Decimal Classification was gaining ground. But Brown felt the Decimal classification was American oriented and, therefore, wanted to produce a British System. In the year 1906 he published the first edition of a scheme which he called *Subject Classification.*

The underlying principles of Subject Classification are that every science and art springs from some definite source; in the order of things there were first the factors, matter and force, which in turn gave place to life. Life in the course of time produced mind, and mind gave birth to records. Another basic principle advocated by Brown was **One Place Theory.** He selected basic concrete themes and attempted to group documents around them. His argument was that a given entry may be viewed from many stand-points. In this context he gives the example of 'Rose'. According to him the entity, 'rose', may be viewed from the stand point of Botany, Horticulture, Decoration, History, Geography, Bibliography and so on. He considers 'rose' to represent a concrete subject whilst the stand-points represent general subjects. He posed a question "Which is better, whether to assemble literature on a concrete subject at a specific

place or disperse it at several places"? His answer was that the interest of the student of 'rose' would be better served if all the topics on 'rose' were made constant. He demonstrated how these principles could be made use of in this 'Subject Classification'. For some details of the scheme in Section 4.3.2. of Unit 4.

3.3 E.C. RICHARDSON

During the same period in the United States of America E.C. Richardson who was the first Librarian at Hartford Theological Seminary and later took over as of Librarian of the Princeton University Library brought out a scheme of classification. His scheme was based on a set of principles. In the year 1901 he published his theory of classification entitled *Classification : Theoretical and Practical.* The basic principles which he called 'Criteria of Classification' are as given hereunder :

1. Classification should follow the order of things; classes should be arranged in a historical sequence : Arrange in an evolutionary sequence.
2. Division of classes should be minute.
3. Arrange things according to likeness and unlikeness.
4. Books are collected for use, they are administered for use and arranged for use and hence it is the use which is the motive of Classification.
5. A scheme of classification should be provided with a notation; the notation should be amenable to indefinite sub-division, preferably using a mixed symbol with decimal base and with mnemonic features.

Richardson asserts that "the things in nature are already classified" and man has only to trace the order of the classification and record it.

3.4 E.W. HULME

The principles of classification enunciated by Hulme have influenced the later theories of book classification. Hulme was the Librarian at the Patent Office Library, London and he published his theory in the year 1911-12 in *The Library Association Record.* According to Hulme, all classifications could be arranged into two groups : (1) Mechanical, and (2) Philosophical. Book classification falls under the first group. Hulme's principles of book classification are as stated hereunder.

1. Book Classification is the mechanical assembling of material objects into classes.
2. The classes so formed should be systematic coordinated classes.
3. Classification should be based on 'Literary Warrant'.

Hulme states that in mechanical classification things are left uncoordinated, but in book classification a systematic coordination of classes is to be introduced. Hulme's theory of 'Literary Warrant' has attracted the attention of later classificationists. According to Hulme, books are "concrete aggregate of facts selected from the common stock of knowledge". What Hulme means by 'concrete aggregate' is that when there are books published separately say 'Electricity' and on 'Magnetism' then 'Electricity and Magnetism' as a subject is a concrete aggregate. In such a case there is a 'literary warrant' for providing a number for such a class.

To make the meaning of 'Literary Warrant' still simpler we may say that a term in the scheme for library classification cannot be enumerated unless some literature has appeared on it. The principle of 'Literary Warrant' has influenced the Library of Congress Classification Scheme to some extent. Dr. Ranganathan made use of this principle, but not exactly in the same sense in which Hulme used it. According to Ranganathan when literature grows on a particular subject, there may arise a need to provide a separate class, if necessary even a basic class for it, in the Classification Scheme.

3.5 W.C.B. SAYERS

In the history of the theory of knowledge classification a number of personalities have made remarkable contributions. In the case of book classification the first systematic theory was formulated by W.C.B. Sayers. He had been the Librarian of Croydon Public Library for nearly 30 years. He also taught at the University of London, School of Librarianship for more than three decades. Sayer's name is always associated with classification. Dr. S.R. Ranganathan described him as 'Grammarian of Classification'. Though Sayers has not designed any scheme of classification he laid the foundation for the theory of book classification. His theory first appeared in 1915 under title, *Canons of Classification.* He further expanded his theory in his book, *Introduction to Library Classification,* published in 1918. This work was followed by an exhaustive treatise on library classification entitled, *A Manual of Classification for Librarians and Bibliographers,* the first edition of which came out in 1926 and the third edition in 1955.

Sayers Canons for Classification

Sayers simplified his theory of classification by putting them under 29 canons. He called his principles 'Canons' meaning rules, regulations, standard tests or criteria of classification. The 29 Canons are further sub-divided as :

1.	as to definitions	-	6
2.	as to division	-	7
3.	as to terms	-	4
4.	as to book classification	-	4
5.	as to notation	-	5
6.	as to book classification schemes	-	3

These canons are briefly explained below :

3.5.1 Definition

Classification is a mental process by which things or ideas are assembled according to their likeness. The likeness which exists in the universe of things and ideas is called the characteristic of classification. In a scheme of classification classes are to be arranged in a systematic order. The order is based on the theory of knowledge.

3.5.2 Division

Assembling things according to their degree of likeness and separating them according to their degree of unlikeliness is the process of division. The chosen likeness or characteristic used to divide a given thing may be natural or artificial. A natural characteristic is possessed by a group of things, for example the colour or height or weight is an artificial characteristic of man. Division should proceed with great extension and small intention. The process of division should be gradual. The characteristics used must be consistent at each stage of division.

3.5.3 Terms

A scheme of classification is a statement of knowledge in terms. A term is a name for a class; it may be a word or a phrase. They should be unambigous and should be used with the same meaning whenever they are used in the scheme of classification. In a scheme of classification the terms used need not be critical.

3.5.4 Book Classification

A book classification is a device for the arrangement of books by subject or form in a logical order. It must be capable of admitting any new subject without dislocating the class of subjects already drawn up. Book classification or classification scheme must be equipped with:

1. a general class;
2. Form class like poetry, fiction, drama, etc.;
3. Forms in which subjects are presented like theory, history, dictionary, etc.,(these are usually called standard subdivisions or common isolates);
4. a notation; and
5. an index.

3.5.5 Notation

Notation is the short signs representing the class-names in the classification. It must be brief, simple, flexible and must have mnemonic value.

3.5.6 Book Classification Schemes

A scheme of classification should provide columnar schedules in the order of the precedence of subjects. The scheme should explain how it should be used. There should be a machinery for the revision of the scheme so as to keep it up-to-date.

Self-Check Exercise-1

What is a canon ?

Note : i) Write your answer in the space given below.

ii) Compare your answer with the model answer given at the end of this unit.

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3.6 H.E. BLISS

H.E. Bliss stands as a unique personality in the field of theory of library classification. He may be regarded as Ranganathan of U.S.A. He devoted almost 30 years of his life to the intensive study of classification. In addition to the articles which he contributed to library journals, his theories and principles of classification were expanded in his first publication entitled *Organisation of Knowledge and the System of Sciences* (1929). In this book he formulated scientific, philosophical and logical grounds for the study of bibliographical classification. This publication has been regarded as one of the basic texts on the theory of organisation of knowledge. He laid the foundation for a relatively stable, scientifically acceptable and consistent scheme of classification. He also published another basic volume on the theory of classification entitled, *Organization of Knowledge in Libraries and the Subject Approach to Books* (1933). These basic books convey to us the fundamental principles of classification which he later tried to implement in his system of *Bibliographic Classification* (1935). He was one of the few classificationists, like Ranganathan, to formulate first the theory of classification and later implement the same in his classification scheme.

The basic principles of classification as expounded by Bliss may broadly be categorized as : 1. Consensus, 2. Subrodination, 3. Collocation, 4. Alternative location and 5. Notation. These principles are briefly discussed here.

3.6.1 Consensus

According to Bliss, book classification is basically classification of knowledge. He has observed that considerable agreement exists among the experts on the arrangement of various branches of human knowledge. Bliss calls this agreement 'Scientific and Educational Consensus'. It is science and education that bring about the growth, organisation and development of human experience and thought which we call 'knowledge'. The term, 'Consensus', refers to a relative agreement as to what are the major classes of knowledge, their scope and the essential relations between them. Bliss has felt that the more closely a library classification reflects the consensus, the more stable, flexible and efficient it will be.

3.6.2 Subordination

According to Bliss, a classification scheme should observe the types of subrodination viz., 1. subordination of the special to the general, and 2. gradation by speciality.

(a) Subordination of Special to the General

This is also referred to as principle of 'decreasing extension'. A classification scheme should arrange subjects in an order of decreasing extension so that the general subject is followed by special subject. The order of subjects as a scheme of classification should reflect the sequence from general to specific.

(b) Gradation by Speciality

According to Bliss, this principle implies that "the generalizations and laws of each of more general sciences are true in some measure of all the more special sciences.... But the laws or truths of more special sciences rarely apply to the more general sciences or solve their problems". This means that special sciences are dependent on the general sciences. For example, according to Bliss, Chemistry though it deals with matter and energy like Physics, is more special than Physics, and is dependent upon it. Bliss felt that this principle was essential to the very process of classification and the order of major classes in the Bibliographic Classification was determined more by this than by any other principle.

3.6.3 Collocation

This means the bringing together of subjects according to degrees of affinity. Ranganathan calls this, 'filiatory sequence'. The principles of subordination and gradation help to decide the sequence of broad subject fields or disciplines and within each subject, the principle of decreasing extension and the various orders in an array determine the sequence. It is also necessary to bring together similar subjects which are most closely related. Therefore, Bliss in his Bibliographic Classification collocates language, a major medium of communication in the Social Sciences; with Literature, a fine art, because of its close affinity. Likewise, Education is collocated with Psychology and Chemical Technology with Chemistry. Collocation generally refers to coordinate classes. But it also refers to subordinate classes. Bliss subordinated Sociology to Anthropology and Anthropology to Biology.

3.6.4 Alternative Locations

The principle of consensus is relative. A scheme for classification should meet the different needs and requirements, especially in classification for a special collection. Therefore, librarians may wish to alter the order established by the logical sequence. A scheme, if it is to be of maximum usefulness, should, therefore, provide for the adaptation of the logical sequence to practical convenience in order to meet different views. Bliss does not believe in rigid and unadaptable view of the order of knowledge. To meet this principle, provision has been made deliberately for alternative locations and treatments in Bibliographic Classification, unequalled by any other scheme. Provision has been made in the 'notation' for moving certain topics to other locations. For example, moving Theology from the main class 'P' Religion to class AJ

following Philosophy; technologies like Aeronautics or Ship Building from Applied Physics to the Useful Arts class; subordinating International Law to Political Science or to Law.

This principle provides the flexibility needed to solve certain problems in classification faced by all the classifiers, whatever scheme they follow.

3.6.5 Notation

Bliss stressed three important qualities for a good notation. These are : The notation should be correlative and subsidiary. The notation should be brief and simple, i.e., the notation should remain reasonably simple. He even suggested an economic limit of three to four digits in a class number; and b) the notation should use the synthetic principle. This means achieving economy in the printing and display of schedules with resulting simplicity of structure and convenience for use. Bliss achieved this by the provision of general and special systematic schedules for the construction of co-extensive class numbers.

3.7 S.R. RANGANATHAN

Dr. S.R. Ranganathan, the father of Library Science in India, was instrumental in revolutionising the theory of classification. He propounded certain fundamental ideas and goals behind the work of library classification. These can be found even in the earlier editions of *Colon Classification,* the first edition of which was published in 1933. He advocated that library classification should consistently conform to the Laws of Library Science and Normative Principles of Classification. He vigorously stated that the class number should fully reflect the extension and intention of the thought content of a document. This, in other words, is known as 'co-extensive class number'. He also felt that individual classifier should be given maximum autonomy to revise the published schedules of a scheme by constructing his own class number for the newly emerging subjects. Through his writings, he worked for helpful and filiatory sequence of classes based on the concept of Facet Analysis and Fundamental Categories; rejecting the earlier schemes based purely on enumeration. Ranganathan's theories and principles on library classification were first published in the form of a book entitled *Prolegomena to Library Classification* in 1937, the third edition of which was published in 1967. This is regarded as one of the seminal works on theory of library classification.

3.7.1 Mapping of Universe of Knowledge

Ranganthan recognished the problem of transforming multidimensional universe of knowledge into unidimensional universe. This is a fundamental and insoluble problem faced by the classificationists in the designing of classification schemes. To meet this problem squarely, Ranganathan advocated Basic Laws, Normative principles, Canons, Postulates and Principles by which the mapping of the Universe of knowledge in the scheme for classificaition could be successfully attempted. These principles are summarised below.

3.7.2 Basic Laws

The five Laws of Library Science, viz., (i) Books are for use, (ii) Every reader his/her book, (iii) Every book its reader, (iv) Save the time of the reader, and (v) Library is a growing organisation, were first formulated in 1928. Later, in the year 1931 these were published in a book entitled, *The Five Laws of Library Science.* The basic laws govern the process of thinking and are invoked when two or more canons or principles of classification lead to conflicting or equally valid different decisions.

3.7.3 Normative Principles

Ranganathan formulated six normative principles, viz., (i) Law of Interpretation, (ii) Law of Impartiality, (iii) Law of Symmetry, (iv) Law of Parsimony, (v) Law of Local Variation, and (vi) Law of Osmosis. These normative principles govern the process of thinking in

classification and are normally invoked when two or more Laws of Library Science or Canons of classification lead to conflicting or equally valid different decisions.

3.7.4 Canons for Classification

Ranganathan has given a real direction to canons for classification first formulated by Sayers. In all, he formulated 43 canons and divided them into three groups, viz., 1. Canons for Idea Plane (15); 2. Canons for Verbal Plane (4), and 3. Canons for Notational Plane (24). These canons are in conformity with the Laws of the Library Science. These are normally invoked in the designing for a scheme for classification. A summary of these canons is given below

(a) Canons for Idea Plane (15)

The canons for Idea Plane are further divided into Canons for characteristics (4); Canons for succession of characteristics (3); Canons for array (4); Canons for chain (2); and Canons for filiatory sequence (2). The four canons for characteristics deal with the process of division of knowledge. The characteristics selected for division should be easily differentiated, relevant, easily ascertainable and permanent. The three canons listed under succession of characteristics deal with the application of more than one characteristic in the process of division of knowledge. The four canons for Array state that classes in an Array should be exhaustive, exclusive, and the sequence among them should be helpful and consistent. The two canons for Chain (subordinate classes) deal with the process of division of knowledge which should proceed from general to specific and it should be properly regulated. The two canons under filiatory sequence state that a scheme for classification should clearly identify both coordinate and subordinate classes and they should be arranged among themselves according to their mutual affiliation.

(b) Canons for Verbal Plane (4)

These four canons deal with the language and terminology aspects in the classificaiton scheme. The terminology used in the scheme should clearly indicate the context in which a particular term has been used and what aspect it comprehends. The terms used to denote ranked isolates should be current and should not be critical.

(c) Canons for Notational Plane (24)

These have been further divided into Basic Canons for notational plane (12); Canons for Mnemonics (5); Canons for growing universe (4); and Canons for Book Classification (3). Notation means the system of ordinal numbers representing the classes in a scheme for classification. The basic Canons deal with the removal of synonyms and homonyms in the class number and the notation should reflect the hierarchy of classes. The base of the scheme should be mixed or pure, notation should be faceted or non-faceted, and the class number should be co-extensive or under extensive.

The Canons for Mnemonics (5) deal with the need for different types of mnemonics, viz., alphabetical, scheduled, systematic and seminal in the scheme for classification.

The Canons for growing Universe (4) deal with the capacity of the notational system for admission of newly emerging classes; Ranganathan called this phenomenon 'Hospitality in Array and Chain'. The notation should admit of new classes at the beginning or at the end or in the middle of the array or chain. This is also known as 'extrapolation' and 'intrapolation' in array and chain.

The Canons for Book Classification (3) deal with the provision of the scheme for the construction of book numbers and collection numbers in the scheme for classification; the sequence of three elements in the call number viz., class number, book number and collection number; and the method of writing these three elements. In Block II Unit 6 you will know more details concerning canons for classification.

3.7.5 Postulates of Fundamental Categories

The most significant contribution to the theory of classification is the enunciation of Postulates dealing with the concept of facet analysis and fundamental categories. According to Ranganathan, most of the subjects are divisible on the basis of five fundamental categories (aspect or point of view), viz., Personality, Matter, Energy, Space and Time. A subject may be the manifestation of any one of these or all of the categories.

(a) Postulates of Rounds of Manifestation

Ranganathan has also postulated that the fundamental category, 'Energy', may manifest itself in one and the same round more than once. The manifestations are called 'Rounds of Manifestation'.

(b) Postulates of Levels of Manifestation

Any of the fundamental categories, 'Personality' and 'Matter' may manifest more than once in one and the same round within a subject, and similar is the case with Space and Time in the last round. These manifestations are called 'Levels of Manifestation'.

3.7.6 Principles of Facet Sequence

Ranganathan has formulated four principles, viz., (1) Whole-Organ Priniple; (2) Cow-Calf Principle; (3) Wall-Picture Principle; and (4) Act-and-Action-Actor-Tool Principle. These principles help in deciding the sequence among facets.

3.7.7 Principles of Helpful Sequence

In order to achieve a helpful sequence of isolates within an array, Ranganathan has formualted eight principles of helpful sequence, viz., (1) Later-in-Time, (2) Late-in-Evolution, (3) Spatial Contiguity, (4) Quantitative measure, (5) Increasing complexity, (6) Canonical sequence, (7) Literary warrant and (8) Alphabetical sequence.

The Basic Laws, Normative Principles, Postulates, Canons and Principles listed in the preceding paras laid a sound foundation for a dynamic theory of classification. The application of these principles have amply been demonstrated in *Colon Classification*. Therefore, the *Colon Classification* from the 4th edition (1952) onwards has changed from a rigidly faceted scheme to a freely faceted scheme based on postulates and principles. The contribution of Ranganathan to the general theory of classification is fundamental, unique and without a parallel. His concepts of Facet Analysis and Fundamental Categories have been generally accepted by other stalwarts in the field of classification. As a result, several special classifications have been designed on the basis of the concepts and principles enumerated by Ranganathan.

Self-Check Exercise-2

(a) State the devices used by Dr. S.R. Ranganathan to classify the universe of knowledge.

Note : i) Write your answer in the space given below.

ii) Compare your answer with the model answer given at the end of this unit

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(b) Explain in two lines the purpose of 'hospitality in array'.

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Ranganathan's Principles of classificaiton will be dealt in detail in Block II.

3.8 SUMMING UP

Growth of knowledge results in the emergence of new subjects and numerous documents on the subjects. These documents are to be helpfully arranged on the shelves of libraries and information Centres. While it may be easy to classify knowledge theoretically, the classification of documents, which some times deal with several subjects, will be very difficult. Earlier, several philosophers attempted the classification of knowledge. In the field of Library Classification thinkers like James Duff Brown; E.C. Richardson; E.W. Hulme; W.C.B. Sayers; H.E. Bliss; and S.R. Ranganathan enunciated theories. In this Unit you have got list of their contributions.

3.9 MODEL ANSWERS

1) Canons are the rules, regulations and criteria of classification. The 29 canons of Sayers are divided as

Definition	-	6
Division	-	7
Terms	-	4
Book classification	-	4
Notation	-	5
Book classification scheme	-	3

2.) (a) Basic laws, normative principles, canons, postulates and principles.

(b) The purpose of Hospitality of array is to accommodate the newly emerging concepts/ideas.

3.10 ASSIGNMENTS

1) Explain briefly the Principles of Classification enumerated by J.D. Brown, E.C. Richardson and E.W. Humle.

2) Discuss the Canons of Classification formulated by W.C.B. Sayers which have laid the basis for the development of the theory of classification.

3) Narrate the basic principles of H.E. Bliss which have added a new dimension to the theory of classification.

4) Discuss the principles of S.R. Ranganathan which have greatly contributed to the growth of a dynamic theory of library classification.

3.11 RECOMMENDED BOOKS

Datta, D.N. *Library Classification Manual.* Calcutta : World Press, 1978. Chapter-7.

Krishan Kumar. *Theory of Classification.* New Delhi : Vikas Publishing House, 1979. Chapter 3 and 7

Mills, J.*A. Modern Outline of Library Classification.* Bombay : Asia Publishing House, 1962. Chapters 2,10,11 & 12.

Ohdedar, A.K. and Sengupta, B. *Library Classification.* 2nd rev. ed. Calcutta : the World Press, 1977. Chapters 2,10&11.

Ranganathan, S.R. *Prolegomena to Library Classification.* 3rd ed. Bombay : Asia Publishing House, 1967 (Reprint by Bangalore : UBS Publishers, 1990). Chapter D toL

Ranganathan, S.R. *A Descriptive account of Colon Classification.* Bombay : Asia Publishing House, 1965. Chapter B and C.

Sayers, W.C.B. *Manual of Classification for Librarians and Bibliographers.* 3rd ed. London : Andre Deutsch, 1959. Chapters 9 and 17 to 19.

3.12 GLOSSARY

Basic Laws : Basic laws are the principles which are general and applicable to any given situation in any context.

Book Classificaiton : A classification system for arrangement of books by subject or form in a logical order.

Canons : In Classification, Canon would mean a rule for Classification. Therefore, Canons for Classification means rules for classification.

Normative Principles : Normative principles are the rules that are to be observed in a given context.

Notation : A system of symbols generally letters and numerals, used separately or in combination, to represent the divisions of a classification system.

3.13 MODEL EXAMINATION QUESTIONS

I. ESSAY QUESTIONS

1) Explain the theories propounded by Bliss and Sayers to Library classification.

2) Discuss briefly the contribution of Dr. S.R. Ranganadhan to the theory of Library Classification.

II. SHORT NOTES

a) Brown's One place theory

b) Richardson's Criteria of classification

c) Hulme's Principles of book classification

UNIT-4 : SPECIES AND SCHEMES OF GENERAL CLASSIFICATION

Contents

4.0 AIMS AND OBJECTIVES

In this Unit we shall try to understand some broad features under which the various schemes of library classification can be grouped.

After studying this Unit you should be able to

- explain some of the terms like 'enumerative', 'analytico - synthetic', 'faceted' schemes of classification, etc.
- categorise the familiar schemes of classification like Dewey Decimal Classification, Colon Classification, etc. into different species of classification.
- Describe briefly some of the selected schemes of Library classification, like EC, SC, BC, LC and BBK.

4.1 INTRODUCTION

In Unit 3 of this Block you have seen how different Schemes for classification have been evolved based on certain principles or theories. These Schemes have followed certain principles and possess some common characteristics on the basis of which they can be grouped under different species. Historically, though there were some earlier attempts to design good schemes of library classification it was only with the publication of the Decimal Classification scheme in 1876 systematic schemes of classification appeared.

'Species' is a term used for a class of individuals having common attributes and designated by a common name. S.R. Ranganathan grouped the schemes of library classification into different species. In this unit we shall try to understand what Ranganathan said about the species of schemes for library classification.

4.2 SPECIES OF CLASSIFICATION SCHEMES

The year 1876 was a landmark in the annals of library classification. In this year Melvil Dewey published his now world famous scheme for library classification, namely, Decimal Classification. Since then several general schemes for library classification have been published. These general schemes have not only greatly helped in the systematic organising of library collection but also contributed to the enrichment of the theory and practice of library classification.

On the basis of certain characteristics like mapping of universe of subjects, type of notation, length of schedules, provision of schedules of common and special isolates, capacity for resilience and structure of class numbers the schemes are identified as General Classification schemes. The existing general schemes for library classification were categorised into six kinds or species; namely 1. Purely Enumerative; 2. Almost Enumerative; 3. Almost Faceted; 4. Fully but Rigidly Faceted; 5. Almost Freely Faceted, and 6. Freely Faceted schemes of library classification.

Ranganathan was perhaps the first person to look at the existing schemes of classification with a view to bring them together under broad categories on the basis of certain common features. His study and analysis which resulted in the above mentioned six species is of great value. It has been observed that the general line of evolution of classification schemes has been from enumerative to freely faceted with guiding postulates and principles. The concept of freely faceted scheme for library classification had a great impact on the thinking about classification and given a new direction to the designing of schemes for library classification and for the development of classification theory. Let us now see what these different species are.

4.2.1 Purely Enumerative Classification

In a Purely Enumerative classificaction scheme all subjects of past, present and those that may come up in the foreseable future are listed in a single group of schedules. No separate schedules are available for common isolates.

The Library of Congress Classification and Riders' International Classification (RIC) are the two schemes which come under this species. The schedules of LC run into 13 volumes. Since it is purely enumerative in nature the notation fails to accommodate new subjects which are not listed in the schedules. The class number is monolithic. That is to say we find the class number given as a single block for each of the subjects listed in the schedules. In such situations we say that the class number is monolithic.

The RIC has been designed as a purely enumerative scheme for classification. The schedule runs into 922 pages and lists about 18,000 subjects. In this scheme very often the

same class number is used to represent several subjects. For example, UJJ is the class number for Diseases of mouth, throat, and esophagus, mumps, tonsilitis, formatitis and Trench mouth. The scheme is so designed that the class number for any subject irrespective of its extension and intension does not exceed three digits. The structure of the class number is monolithic.

In general the species of this kind, purely enumerative, suffers from the following drawbacks : 1. They have lengthy schedules; 2. They are non-accommodative to newly emerging subjects to find place in a filiatory sequence among the subjects in existence; 3. Their class numbers are not separated into meaningful facets, though they consist of a succession of semantically rich digits; 4. Class numbers tend to be monolithic in nature.

4.2.2 Almost Enumerative Classification

"An Almost Enumerative Scheme of classificaiton consists of a large schedule enumerating most of the subjects of the past, the present and anticipatable future and in addition a few schedules of common isolates".

C.A. Cutter's *Expansive Classification* (EC) and Melvil Dewey's *Decimal Classification* (DC) and JD Brown's *Subject Classification* (SC) fall under this category.

EC consists of a main schedule (A-Z) supported by auxiliary tables for a) Form classes and form division; and b) Geographical divisions. The schedule is lengthy as it lists out simple compound subjects. Class numbers for many compound classes can be constructed by the combination of subjects enumerated in the schedules with the support of anciliary tables. Even then the EC will be overpowered by newly emerging subjects. The structure of the class number is monolithic.

The SC consists of a main schedule (A-X) supported by schedules of common isolates : a) Categorical Tables; b) Local Numbers; c) Date Numbers and d) Large Numbers. The main schedule A to X enumerates subjects. Most of them are compound subjects. The schedules are fairly long. Class numbers for many additional compound classes can be constructed by combining subjects enumerated in the schedules, supported by common isolate schedule. In spite of this the SC will be overpowered by newly emerging subjects as the schedules of common isolates are limited and short. A decimal point is prescribed as a connecting symbol for the use of categorical numbers.

Example : L145.1 Bibliography of Wages. Here L 145 stands for 'wages' and .1 is the common isolate for 'bibliography'.

The scheme also provides + (plus) sign to represent a mere addition.

Example : C200+300 Heat and Sound. In C Schedule 200 stands for 'Heat' and 300 for 'Sound'.

Thus, we see that all the class numbers in the SC are not monolithic.

The Dewey Decimal Classification (20th Edn., 1989), issued in 4 volumes, consists of main schedules in two volumes (volumes 2 and 3) supported by common isolates of space, time and form known by the name of Auxiliary Tables (Volume 1). The general schedule in two volumes enumerates in detail simple and compound subjects, Provisions of common isolates and inclusion of instructions like "Add to....." and the subject devices (SD) have transformed the DC from a purely enumerative to an almost enumerative scheme for classification.

The positive aspects of an Almost Enumerative Scheme for classification are the following:

a) enumeration of not only basic subjects but also compound subjects;

b) provision of a few schedules of common isolates which support the main schedule for the construction of class numbers for some more compound subjects

The negative aspects are the following : (a) Lengthy schedules which soon will be overpowered by the newly emerging subjects beyond any anticipation; (b) Class numbers usually consist of succession of semantically rich digits which may not have been separated by meaningful facets.

4.2.3 Almost Faceted Classification

"An Almost Faceted Scheme for classification consists of a large schedule enumerating most of the subjects of the past, the present and the anticipatable future, and in addition a few schedules of common isolates and also some schedules of special isolates".

The schedule of subjects of a scheme which comes under this category or species will enumerate not only basic subjects but also many compound subjects. With the help of the schedules of common isolates and special isolates class numbers for more compared classes can be constructed. The class numbers so constructed with the aid of common isolates and/or special isolates will contain connecting symbols of a species different from semantically rich digits used in the schedules for the class numbers and isolate numbers. The compound class number thus formed by the combination of common isolates and special isolates will be polylithic. The schedules of schemes for classification which come under this category are generally long as they try to enumerate a long list of subjects of the past, the present and the anticipatable future. Universal Decimal Classification (UDC) and Bibliographic Classification (BC) fall under this species.

UDC's general table resembles that of the DC. It consists of mostly compound subjects with certain modificaitons. It also provides four independent schedules of common isolates, namely, Form, Place. Time and Point-of-view. Distinct symbols have been provided for using these common isolates to connect them to the main UDC numbers. Schedules of special isolates have been provided for some subjects. The schedules of the UDC are long. The use of several auxiliary schedules; provisions to combine two class numbers either by : (Colon) or + (plus) sign and also the use of several other connecting symbols has enabled the UDC to be resilient enough to meet the pressure of newly emerging subjects. The use of several connecting symbols helped the class number to become polylithic.

The BC consists of a large general schedule enumerating basic and compound subjects. It also provides four schedules of common isolates which Bliss named them as 'Systematic Schedules' which are 1. Anteriorising; 2. Time; 3. Geographical; and 4. Language divisions. It also provides for seven other auxiliary schedules listing historical and philosophical divisions. These common isolates and thirty one tables of special isolates helped to provide certain amount of resilience to the BC. The general table extends to 900 pages. It also uses some connecting symbols and, therefore, the class number is polylithic.

4.2.4 Fully But Rigidly Faceted Classification

"In a Rigidly Faceted Scheme for classification, the facets and their sequences are predetermined for all subjects going with a basic subject".

In this type of classification scheme, each basic subject is divided on the basis of facets. The sequences of these facets are pre-determined. Each one of the facets prescribed in the 'facet formula' should find a place in any compound subject of a document to be classified, even if it does not warrant such a use of all the facets of a subject. This results in the rigidity of the facet formula and also leads to the cluttering of the connecting digits.

The Colon Classification (CC) upto third edition (1950) is an example of such a category. The example given below demonstrates the rigidity.

Example :

The Facet Formula for the Main Class, 'Engineering' was

I. Engineering (Work) : (Secondary work) : (Part) / (Problem)

1. Railway carriages D5153 (work facet)
2. Windows for railways carriages D5153:67 (work facet and secondary work facet).
3. Designing of windows for railways carriages D5153:67::4 (In this while other facets are present the part facet is absent. Since the facet occurs in the middle of the formula colon (:) has to be shown in the class number to indicate its absence).

   Now, look at this example :

4. Designing of railway carriages

D5153 : : : 4 (In this second and third facets i.e., the secondary work facet and part facet are absent. But their absence has to be indicated by the repetition of (:) colons in the class number.

4.2.5 Almost Freely Faceted Classification

To remove the rigidity in the faceted scheme for classificaiton, different connecting symbols have been employed for different kinds of facets. Further, concepts like 'rounds' and 'levels' have also helped remove the rigidity in the class number and the sequence of facets that occurs in the compound subject. Because of these innovations the CC from Edition 4 (1952) to Edition 6 (1963) has become 'Almost Freely Faceted Scheme' for classification. This is regarded as a second version of CC.

The Facet Formula for Engineering in the 6th Edition of the CC and the Class numbers for the four titles quoted in the previous section are given below from which the removal of the rigidity can be clearly seen :

	D [P]	,[P2]	:[E] [2P]
	Work	Part	Problem
1.	Railway carriages	D5153 [P]	
2.	Windows for railway carriages	D5153, 67 [P] [P2]	
3.	Designing windows for railway carriages	D5153, 67:4 [P] [P2] [E] [2P]	
4.	Designing of railway carriages	D5153:4 [P] [E] [2P]	

4.2.6 Freely Faceted Classification

"in Freely Faceted Schemes for classificaiton, there is no rigid predetermined facet formula for the compound subjects going with a basic subject". In this scheme for classification whatever facets occur in a compound subject are identified by the facet analysis of the subject. The sequence of facets identified will be determined by postulates and principles, and facet terms are arranged in that sequence. Each facet term is replaced by its facet number. Finally, the facet numbers are synthesised into a class number with the aid of appropriate connecting symbols representing each facet. Thus, each compound subject determines its own facet sequence. There is no rigidity either in the class number or in the succession of facets. Rigitidy is completely eliminated.

Exposition of a dynamic theory of classification and introduction of notational techniques has enabled the CC to be truly Faceted Scheme for classificaiton. Colon Classification (CC) Edition 7 was published in 1987. Prior to this a 'Preview of CC Edition 7' was published in 1971. Some 'pilot schedules' were also published. Even in its present form, as published in

1987 the CC is incomplete.

The analytico-synthetic nature of the scheme has been explained in the preface to 1987 Edition as follows : "This edition has been developed analytico-synthetically. It is based on postulates in three planes of work namely idea plane, verbal plane and notational plane. The blending of the work in these three planes is guided by the Laws of Parsimony and Symmetry. Hierarchy of formulation of class numbers is maintained as far as possible."

Self-Check Exercise-1

(a) State the six kinds of species of library classification.

Note : i) Write your answer in the space given below.

ii) Compare your answer with model answer given at the end of this unit.

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(b) Mention the drawbacks of a purely enumerative scheme of classification.

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(c) Give two examples of a faceted classification.

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4.2.7 Analytico-Synthetic Classification

The term 'Analytico-synthetic Classification' is used to denote any scheme in which a compound subject is first analysed into its facets in the Idea plane and later synthesised in the Verbal Plane and in the Notational Plane, respectively". Remember that any faceted classification cannot claim that it is analytico-synthetic unless it is freely faceted. It is the Colon Classification from its Edition 4 (1952) onwards that can be considered to be a truly Analytico-synthetic scheme for classification.

Identification of important characteristics for each species of classification will help us to understand the nature of existing general schemes. It will also enable us to study these schemes methodically and critically. The chief characteristics of various species will become the basis for a comparative study of classification schemes.

Self-Check Exercise-2

(a) The rigidity in the faceted classificaiton is reduced with the use of

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(b) The best example for a analytico-synthetic scheme of classification is

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Note : i) Write your answer in the space provided.

ii) Compare your answer with model answer given at the end of this unit.

4.3 SCHEMES OF LIBRARY CLASSIFICAITON

As we had discussed earlier in Unit-3, many stalwarts in the field of Library Classification like J.D. Brown, E.C. Richardson, E.W. Hulme, W.C.B. Sayers, H.E. Bliss and Dr. S.R. Ranganathan by the end of 19th century and beginning of 20th century have enumerated their principles and theories of classification. All these theories and principles are applied by the classificationists in designing of their own classification schemes. The present Section covers some of the classificaiton schemes viz., EC, SC, BC, LC and BBK.

4.3.1 Expansive Classification (EC)

Expansive Classification (EC) was devised by Charles Ammi Cutter, Librarian of Boston Museum. He described EC in his article entitled, *Classification on the Shelves,* in the year 1879. Cutter did not want to change the system of 'Fixed Location', which was used in Library of Boston even after the DDC was introduced in many libraries. He decided to modify the arrangement by adopting a larger base using the letters of the alphabet to designate classes and by establishing a system of book number based on author entry. As a result, he designed seven separate enumerative classifications namely, *Expansive Classification* that was useful to meet the needs of a library in its successive stages of growth. The first six Tables were published during 1891-1893, while the seventh Table was published in parts between 1896 and 1911. He also made use of synthetic devices such as form and place, time/period dividions. EC used the mixed notation and decimal point was used as a notational device. Further, it also made provision for use of Language and Literature lists, Cutter Author marks and Cumulative alphabetical Index.

The first classification subtitled for a very small library, consists of seven main classes and one sub-class. Each class has been assigned a capital alphabet. For example B Philosophy and Religion.

The number of main classes and sub-classes in each classification is as follows :

	Main Class	Sub-Classes
First Classification	7	1
Second Classification	14	1
Third Classification	25	2

Fourth Classification	25	34
Fifth Classification	25	52
Sixth Classification	25	100

The seventh classification was developed in greater detail than the sixth classification. This edition was published in 18 parts between 1896-1911. The Seventh classification consists of 27 main classes from A-Z. The main classes of EC are said to follow the "Inverted Baconian Order". Each main class is sub-divided into a sub-class and a sub-class is further sub-divided into sub-sub-classes and so on, by using the alphabets, in an alphabetical sequence.

The EC is claimed to be the very useful classification scheme available for the use of different levels of libraries, having varied collections. The notation used is simple and notation number also may be reduced according to the level of library without disturbing the original base number. Besides a little synthesis is also possible by attaching time and place isolates/ facets to the scheduled number to reduce the size of the schedules. However, EC has not been used in many libraries.

4.3.2 Subject Classification (SC)

The Subject Classification (SC) was designed by James Duff Brown and first published in 1906. Prior to the design of this Subject Classification he made two attempts. The first one was in 1894. He published Quinn-Brown Classification in collaboration with John Henry Quinn and secondly, the Adjustable Classification in 1898. During this period the Dewey Decimal Classification was becoming popular which is an American oriented system. So, he wants to develop a British oriented system to meet the needs of British libraries of all kinds and sizes with the aim to make the scheme simple, logical and practical in use.

The second edition of the scheme was published in 1914 and the third edition appeared in 1939. The third edition has undergone a number changes, including amendments and alterations suggested by number of professionals.

The scheme is outlined on the line of Richardson's Classification, theoretical and practical (1901) by the order of sciences.

The scheme has the follwong distinctive features :

1) The scheme is completely based on two principles viz., 'One Place Theory' and 'Science and Application Theory'
2) The collocation of theory and practice. It places the subjects with the sciences from which they were derived.
3) Inclusion of topics "pervasive of all knowledge" in the generalia class
4) A table of categories and forms for the sub-division of subjects
5) One place index
6) The scheme particularly hospitable to new compounds

The main classes of SC proceeds from A to X and follows the broad grouping of Matter, Life, Mind and Record. The notation used in SC is simple and mixed as it uses only letters and numbers and the point as a separator. More over, the SC also made an attempt to achieve hospitality by using gaps, decimal extension and also common sub-divisions in the form of integers.

4.3.3 Bibliographic Classificaiton (BC)

Henry Evelyn Bliss (1870-1955), author of *Bibliographic Classification* devoted a large part of his life to the study of theory of classification. His original thoughts and plans were expressed in an article in *Library Journal* published in 1910. His first book *The Organisation*

of Knowledge and System of Sciences (1929) was the result of his long study of methods of organisation and explores the underlying structure of the universe of knowledge. His another work *The Organisation of Knowledge in Libraries and Subject Approach to Books (1933)* relates his findings more specifically on bibliographic organisation. After publishing major writings on classifications he issued a volume on the outline of BC entitled, *A System of Bibliographic Classification* (1935) and the first full edition of the Scheme appeared in four volumes over the period 1940-53. An abridgement to the BC of 1935 was also published in 1964 to meet the requirements of the ordinary school libraries.

Bibliographic Classification is almost a faceted scheme. Bliss recognised that "Composite Specification" (a form of synthesis) is necessary for any classification scheme. This can be achieved by ways of i) the provision for common facets (which could be applied or attached anywhere to the main class), and ii) the provision of facets appropriate to particular subjects (which were accommodated in four schedules).

Bibliographic Classification is based on five sound theoretical principles. They are Consensus, Subordination, Collocation, Alternative Locations and Notation. Consensus here refers to relative agreement as to what are the major classes of knowledge, their scope, and the essential relations between them. According to Bliss, a classification scheme should observe two types of Subordination : 'Subordination of Special to the General' and 'Gradation by Speciality'. That means the order of subjects in a scheme of classification should reflect the sequence from general to specific and the special sciences are dependent on the general sciences. S.R. Ranganathan called Collocation as 'Filiatory Sequence' which refers to bringing together of all coordinate and subordinate classes and arranging them according to degrees of affinity. The principle of 'Alternative Locations' is needed to solve certain problems faced by classifiers by altering the sequence of classes in classification scheme. Regarding notation, Bliss stressed that notation should be brief, simple, correlative, subsidiary and also should use the synthetic principle.

The main classes of BC are represented by Roman alphabets and consists of large schedule enumerating basic and compound subjects. It also had the provision for common and special isolates. Ranganathan named the common schedules as 'Systematic Schedules' which are ; 1) Anteriorising. 2) Time, 3) Geographical, and 4) Language divisions. Further, it also provides seven other auxiliary schedules listing historical and philosophical divisions. In addition to these common isolates 30 tables of special isolates are also helping BC to acquire certain amount of resilience. The Bliss Classification scheme made use of Mnemonic and Hospitality qualities also.

The second edition of BC (BC2) is a radically revised scheme based on the modern theory of library classification and prepared under the auspices of the Bliss Classification Association. The revised schedules began to appear from 1976 and the complete scheme was to be published in 20 volumes through 1980. The structure of the main classes as formulated by Bliss in BC1, has not basically changed but alterations have been carried out on an extensive scale within the classes. Of the 20 volumes planned, only four have been brought out. Volume one contains the Introduction and Common facets. The auxiliary schedules are comprehensive and includes Common Forms, Common subjects including Persons, Time, Place, Language, Ethnic Groups and History. All the schedules follow the principle of inversion and BC follows the retroactive notation, which provides enough scope for constructing compound subjects.

Most of the American libraries had already been classified by either DDC or LC and could not change over to a new system, when the first edition of BC was published by the H.W. Wilson Co. (1935-1953). Hence, BC2 has to depend on the new users. According to Mills, 90 libraries were using BC1 at one time and most of them are predominantly academic, government and special libraries.

4.3.4 Library of Congress Classification (LC)

Library of Congress Classification (LC) is an enumerative scheme of classification. It more clearly resembles that of Cutter's Expansive Classification (EC). In LC the traditional disciplines are chosen as the main classes. Therefore, it has a book-oriented basis rather than a philosophical basis. It does not follow the theory of classification. Most of the Scheme appeared between 1899 and 1930. Each main class is separately published, LC is a series of special classifications, each covering a major class. At present there are 29 separate schedules for the classes and sub-classes.

The notation is simple and mixed. LC used Roman capitals A to Z for representing the main classes, two letters for the sub-divisions of the main classes and integers 1 to 9999 for further divisions. The Scheme lacks common auxiliary divisions, which are applicable for the whole scheme. Hence, the work for synthesis is limited in LC. However, the form, period and country divisions are enumerated frequently in the Schedule. The LC is further equipped with the features of literary mnemonics, phase relations and hospitality to accommodate new classes. The LC does not have the general index to the whole scheme. Each class has its own index. The Scheme is facing a serious weakness as it lacks a complete index to the scheme. To overcome this *The LC List of Subjet Headings* is used as a substitute for the index. The LC also lacks directions for its use

The individual schedules are revised and published regularly. Additions and changes to LC are published quarterly in *LC Classification - Additions and Changes.* This information is also available in the weekly edition of the *LC Information Bulletin.*

The LC Classification is said to be one of the oldest schemes meant for the collections of Library of Congress. It is widely used in many libraries of United States because of its simplicity. As the main classes are represented by Roman alphabets, it can be hospitable to accommodate as many subjects as it can. At present, the LC numbers have also been provided in Cataloguing-in-Publication data.

4.3.5 Bibliothecal-Bibliographical Classification (BBK)

A number of classification schemes were worked out in first half of the 19th century. In late 19th century, DDC evoked great interest in Russia and gradually introduced in library practice. While in practice the Russian Librarians felt that the DDC lacked sufficient scientific grounds. Therefore, an attempt was made in the beginning of the 20th century to create a Russian classification based on a decimal system was made by P.M. Bogdanov. Meanwhile, they used UDC but found that could not meet the requirement of Soviet libraries, as they lacked sub-divisions for classification of new subject literature. After 1945 UDC continued to publish the revised editions to the use for public and regional libraries. The use of abridged edition in the public libraries and full schedules in technical libraries to meet the requirements of all soviet libraries prompted the design of an integrated system, namely, Bibliothecal-Biliographical Classification (BBK) based on the Marxist-Leninist Methodology.

The BBK has come in 25 issues (30 volumes) of schedules during 1960-68, as a result of the involvement of 800 scientists in the compilation and approval of BBK. The BBK comprises 45,000 classes 4,400 special auxiliaries and 2,400 general and geographical sub-divisions.

The structure of the scheme may be regarded as a mixture of UDC and DDC, although it uses letters of the Cyrillia alphabets for the disciplines and decimal numbers only for their sub-divisions. It is a classification system of the semi-facet type on which common divisions (both special and general) are broadly used, for the purpose of flexibility. The main array has 21 classes defined by the letters of the Russian alphatet. The notation of BBK is a logical and expressive, and combines letters and numerals according to the decimal principle. A space is left behind after every three numbers just as in DDC. 'Add note' has been applied whenever

necessary in the schedules. During 1970-72 abbreviated schedules for scientific libraries were produced with cumulative alphabetical subject index. The updating of the schedules, by issuing supplements and amendments regularly from 1969. One volume edition has been published for the use of small libraries in 1975.

Each issue of the BBK has a separate alphabetical subject index and general cumultive index for all the issues at the end. Likewise, the abbraviated schedules of five issues, published in six volumes have a cumulative alphabetical subjcet index.

At present, a number of large scientific libraries, of the Russia and other Socialist states are using BBK. Twenty out of 30 volumes of the full edition have been translated into German. The University Library of East Berlin has adopted the classification for its systematic catalogue. Lenin Library in Moscow is continuously publishing, editing and compiling the editions of BBK.

4.3.6 Popular Schemes of Library Classification : DDU, UDC and CC

Apart from the above, there are also some other classification schemes like DDC, UDC and CC which were much popularised in India. The Classification Schemes DDC, UDC and CC are discussed in detail in Units-13, 14 and 15 of this Course.

Self Check Exercise-3

1) What are the salient features of Subject Classification ?

Note : i) Write your answer in the space given below.

ii) Compare your answer with the model answer given at the end of this Unit.

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4.4 SUMMING UP

In this Unit we tried to group the familiar schemes of library classification on the basis of their broad common features. It was Ranganathan who made such an attempt for the first time. He identified six different species and named them as : 1. Purely Enumerative; 2. Almost Enumerative; 3. Almost Faceted; 4. Fully But Rigidly Faceted; 5. Almost Freely Faceted; and 6. Freely Faceted schemes for classification. These terms were explained with some examples in this Unit. A brief study of selected classification schemes, namely EC, SC, BC, LC and BBK was also presented.

4.5 MODEL ANSWERS

1. (a) Purely Enumerative; (b) Almost Enumerative; (c) Almost Faceted;
   (d) Fully but rigidly Faceted; (e) Almost Freely Faceted; (f) Freely Faceted.
   (b) The notation fails to accommodate new subjects.
   (c) (i) Universal Decimal Classification
   (ii) Bibliographic Classification.
2. (a) Connecting symbols for different facets and use of rounds and levels.

(b) Colon Classification Ed. 7.

Merits :

a) The Scheme is based on 'One-Place Theory' :

b) A separate table has been given for the categories and forms subdivisions and subjects.

c) Index is provided at one place; and

d) The scheme is hospitable to new compound subjects.

Demerits :

a) Literal numerals are completely absent;

b) There is no revision of the scheme to keep it upto date; and

c) Related material is scattered at many places.

4.7 RECOMMENDED BOOKS

Bliss, H.E. *Organisation of knowledge in libraries.* 2nd ed. New York : Wilson, 1939.

*Classification in the 1970's : A second outlook/*ed. by Arthur Maltby. Rev. ed. London : Clive Bingley, 1976.

Dahlberg, Ingetrant. 'Major development in Classificaiton'. *In Advances in Librarianship.* Vol. 7, ed. by Voigt, Melvin T and Harris, Michael H. New York : Academic Press, 1977; P.66-73.

*Encyclopaedia of Library and Information Science/*ed. by Allen Kent *et al.* New York : Marcel Dekker. (See Vol. 2(BC); 3(SC); 8(EC); 9(LC); and 26 (BBK).

Foskett, A.C. *The subject approach to Information.* London : Clive Bingley, 1982.

Krishan Kumar. *Theory of Classification.* New Delhi : Vikas Publishing House, 1979. Chapter 4.

Mills, J and Broughton, Vanda. *Bliss Bibliographic Classification. (Vol. I : Introduction and Auxiliary Schedules).* London : Butterworths, 1977.

Needham, C.D. *Organising Knowledge in the Libraries.* 2nd rev. ed. London : Adre Deutsch, 1973.

Raju, A.A.N. *Decimal, Universal Decimal and Colon Classification : a study in comparison,* Delhi : Ajanta Publications, 1984. Chapter 3.

Ranganathan, S.R. *Colon Classification*, 7th ed. Bangalore : Sarada Ranganathan Endowment for Library Science, 1981.

Ranganathan, S.R. "Colon Classification. Ed. 7 (1971) : a Preview". *Library Science with a Slant to Documentation,* V6, 1969 (pp204-5).

Ranganathan, S.R. *Prolegomena to Library Classification.* 3rd ed. Bombay : Asia Publishing House, 1967 (Reprint by Bangalore : UBS Publishers, 1990) Chapter D to L.

4.8 GLOSSARY

Alternative Location : Explicit provision of more than one location for a class in Bibliographic Classification allowing the librarian to choose for himself the one best suited to his needs.

Anterior Numeral Classes : Bliss name for classes 1/9 in BCI.

Bibliographic Classification : (i) Classification scheme providing class marks for specific summarisations (Close classification). (ii) Classification of documents as distinct from the classification of other subjects.

Collocation : Bringing classes together according to the degree of their application or likeness.

Enumerative Schemes : All the developed and developing subjects are listed in a single group of schedules.

Faceted Scheme : The scheme consists of schedules enumerating most of the subjects and a few schedules of common isolates and special isolates.

Species : A class of individuals having common attributes and designed by a common name.

4.9 MODEL EXAMINATION QUESTIONS

I. ESSAY QUESTIONS

1) What do you understand by 'Species of Classification' ? Describe them briefly with examples.

2) List out various schemes of Library classification and describe them briefly.

II. SHORT NOTES

a) Analytico-Synthetic Classification

b) BC2

BLOCK-II : POSTULATIONAL APPROACH TO CLASSIFICATION

In the previous Block (Theory of Classification), we have studied the need and purpose and theory of Library Classification. We have also studied how few schemes of classification have arranged (mapped out) different subjects in their respective schemes. In this process classificationists have confronted several hurdles in mapping out the subjects. A subject can be classified at different places and can be interpreted in several ways. As the growth of the knowledge is infinite, new subjects keep on cropping up. These new subjects are to be accommodated in the classification scheme without disturbing the existing order. When a subject is inter-disciplinary in nature, it creates more difficulties than any other with regard to its interpretation and eventual classification.

Dr. S.R. Ranganathan formulated a dynamic theory for library classification to meet some of the difficulties of accommodation of subjects in their logical order. He called it "Postulational Approach to Classification". A postulate is not a law but it lays down a few principles. These principles are supposed to be helpful to the achieving of the purpose on hand.

One major break-through in Library Classification theory was the laying down of the postulate of Fundamental Categories. Basic Facet, Isolate and Rounds and Levels are discussed in Unit-5. Facet Sequence is yet another aspect for which several principles are laid down (Discussed in Unit-6). Units 7 and 8 discuss the Phase Relations and Common Isolates. Another important aspect is 'Canons for Classification'.(discussed in Unit-9).

UNIT-5 : FUNDAMENTAL CATEGORIES; BASIC FACET; ISOLATE; ROUNDS AND LEVELS

Contents

5.0 AIMS AND OBJECTIVES

Knowledge is dynamic, ever growing and multidimensional. Documents in a library are records of knowledge. The problem of classification lies in finding a helpful linear arrangement for the documents whose thought contents are multidimensional in nature. Various classificationists propounded principles and theories to solve the problem. The concept of postulational approach propounded by Ranganathan offers one of the best solutions to the problem. This Unit attempts to cover the concept of postulational approach and the famous postulate of fundamental categories of Ranganathan.

On studying this unit you should be able to

- explain the postulational approach; its need and advantages ;
- identify the five fundamental categories - Personality, Matter, Energy, Space and Time (PMEST) propounded by Ranganathan
- describe the postulate of Basic facet and Isolate facet
- discuss the concept of Rounds and Levels of manifestation

5.1 INTRODUCTION

In Block I, Unit I of this Course the Knowledge, its nature structure and growth are discussed. In Units 2 and 3 of the same Block the need for library classification is established and some general theories of library classification are described in brief. Unit 4 of Block I points out how Ranganathan proposed to group different schemes for library classification under broad categories as per their common features.

Ranganathan's contribution to the theory of library classification is immense. His seminal ideas have added new dimension to library classification.

Fundamental categories are the basic foundation of Colon Classification. In the process of division of the universe of subjects, each basic class is divided into facets through the application of trains of characteristics. The resultant facets have to be transformed into fundamental categories. This process is known as Facet analysis and fundamental categories. Further steps in the process of division of the universe of subjects indicate that facets have to be further divided into isolates and isolates into sub-isolates. Thus the process continues.

In this process of division, a basic subject may yield more than one facet. Whatever may be the number of facets, they should be deemed to be manifestation of one or the other of the five fundamental categories. This has been demonstrated through the postulates of 'Rounds and Levels'.

5.2 POSTULATIONAL APPROACH

In Block I, Unit I, the growth and qualities of knowledge are explained. The dynamic, ever growing, multidimensional and multifaceted knowledge as embodied in documents pose a problem to the classificationist in designing a scheme for library classification. The universe of subjects is multidimensional and multifaceted in nature. In library classification we can place each document at one place in a helpful sequence in relation to other documents concerned with the same specific subject. That is the arrangement of documents in a linear sequence on the shelves. The multidimensional and multifaceted nature of knowledge has to be brought into a linear sequence. Thus library classification is faced with the problem of mapping the multidimensional knowledge as embodied in documents along a line.

Different schemes have provided different solutions to this problem. This problem of mapping the universe of subjects was to a great extent been solved by S.R. Ranganathan through the formulation of certain guide-lines. This, according to him, is the postulational approach to library classification. A postulate is a statement about which we cannot use either of the epithets, 'right' or 'wrong'. We can only speak of a set of postulates as 'helpful' or 'unhelpful'. Certain seminal ideas have been postulated with which work is carried out. Postulates are certain assumptions which are helpful in carrying out the process of classification of documents.

5.2.1 Need for Postulational Approach

The magnitude of the problem is evidenced by the fact that millions of isolate ideas, facets and subjects require the establishment of their mutual relationships and helpful arrangement in a linear sequence. While achieving a linear sequence for unidimensional sequence we must

see that the near relationships and the distant relationships of a subject are not disturbed. The sequence thus achieved should be most helpful to the users of the library. This charting of multidimensional and multifaceted knowledge into a linear sequence is extremely complicated and difficult. Through certain assumptions (postulates), the problem of charting the universe of knowledge has been tackled.

5.2.2 Advantages of Postulational Approach

The postulates propounded by Ranganathan have been found to be helpful in mapping the universe of subjects. From 1955 onwards he used the postulates of Five Fundamental categories as well as other postulates and principles going with library classification. In practical classification the sequence of compound and complex subjects going with a basic subject is not predetermined, but should be helpful to the majority of readers. Postulational approach achieves not only a helpful sequence of subjects but also consistency of facets in all subjects and even the sequence of successive characteristics used in this chain from the first link to the last one. The most important achievement of the postulational approach according to Ranganathan, is that "classification of a subject on the basis of Postulates and Principles is done without any predetermined idea about the facets it should or should not have, or about their number or about their sequence. The resulting scheme for classification is a Freely Faceted Classification in every sense of the term". *(Prolegomena,* p. 397).

Postulational approach puts the theory and the practice of classification on sound basis. The approach has made the discipline. "Classification" both interesting and easy. Practice based on the postulates is regarded as classification 'without tears'. A classificationist who designs and develops schemes for classification should depend upon this approach to avoid pitfalls. This approach also helps the classifier in avoiding a wrong approach to classification. For a comparative study of different schemes these postulates act as useful tools to test the efficiency or otherwise of the schemes.

5.3 APPLICATION OF POSTULATIONAL APPROACH

While charting the universe of knowledge different schemes have followed different methods and approaches. Ranganathan on the basis of certain assumptions, i.e., postulates proceeded step by step to chart the universe of subjects methodically and scientifically. The following chart shows the process of division of universe of subjects.

The process of division of universe of subjects upto 2 is almost the same in all the schemes for library classification. From step 3, the process of division differs from scheme to scheme. It is at step 3 of the process of division that Ranganathan has expounded fundamental ideas generally referred to as 'Facet Analysis' and 'Fundamental Categories'. He has fourmulated certain postulates to proceed further in the process of division which leads to the exposition of analytico-synthetic scheme of classification. The postulational approach has added a new dimension to the theory of classification by providing clarity of thought and action for pursuing the theory and practice of library classification.

These postulates have been very lucidly and exhaustively presented by Ranganathan in his *Prolegomena to Library Classification* (3rd ed., 1967), which is regarded as one of the Seminal contributions to the general theory of library classification. The postulate pertaining to fundamental categories with examples is explained here in Section 5.4

Self-Check Exercise-1

(a) Dr. S.R. Ranganathan has introduced_____to solve the problem of the mapping of universe of knowledge.

(b) A postulate is_____.

(c) The advantage of postulational approach is_____.

Note : i) Fill in the blanks

ii) Compare your answer with the model answer given at the end of this unit.

5.4 POSTULATE OF FUNDAMENTAL CATEGORIES

The word group "fundamental categories", is defined by enumeration only. The Postulate states that "there are five and only five fundamental categories, viz., Time, Space, Energy, Matter and Personality" *(Prolegomena,* p. 399). For the sake of brevity these are represented as PMEST. These terms and ideas represented by them have been strictly used in the context of library classification. Their usage here has nothing to do with the use of such terms in Physics or Metaphysics. These are assumed categories and have nothing to do with Aristotlean categories. The significance of these categories can only be seen in relation to statements about the facets of a subject, their separation and their sequence. Each facet of a subject and each division of a facet may be regarded as the manifestation of the fundamental categories.

Let us consider the meaning of these terms and find out what concepts and ideas they include :

5.4.1 Time

The dictionary meaning of the term 'Time' is absolute duration, a moment at which things happen. It gives the least difficulty in its appearance in a given subject. It is used here in accordance with what we commonly understand by the term, 'time'. Isolate ideas such as millenium, century, decade, year, month and so on are taken to be the manisfestations of time. Another kind of time isolates, such as day, night, seasons, and time with meteorological quality as wet, dry, snowy, stromy, etc., are also taken as the manifestations of the fundamental category, Time. Any subject can be qualified by time. Here are some examples of the manifestation of Time.

1. Development in Physics during the 20th *century.*
2. Temperature during *day time.*
3. India's Foreign Policy in *1980*
4. Skating in Alps during *winter*
5. Cyclones during *South East Monsoon.*

In classification schemes the manifestation of the fundamental category, 'Time', is listed as 'Time Isolates' or 'Chronological divisions, and Featured Time Isolates'.

5.4.2 Space

The dictionary meaning of the term 'Space' is that in which material bodies have extension.

It comes next to Time in difficulty in respect of its identification. Its manifestation is confined to the earth and its physical features. The surface of the earth, the space inside it, and the space outside it are its manifestations. The common geographical isolate ideas such as continent, country, district, taluk, mandal; population clusters like city, town, village; water formations such as ocean, river, lake; phenomena like mountain, plataeu, etc., are taken to be the manifestations of the fundamental category 'Space'. The manifestation of Fundamental Categories - Time [T] and Space [S] - can easily be understood and identified in a given title. Here are some examples of the manifestation of Space.

1. Heavy industries in *India*
2. The origin of the river *Ganges*

3. Airconditioning in *Tropics*
4. Public library services to *villages*
5. Navigation in *Indian Ocean*
6. Small Scale Industries in *Hyderabad City.*

5.4.3 Energy

The dictionary meaning of the term 'energy' is power of doing work; vigorous activity.

The manifestation of energy is action of one kind or another. The action may be among all kinds of entities such as animate, inanimate, conceptual, intellectual and intuitive. Its identification is a little more difficult than that of Time or Space. Isolate ideas such as structure, morphology, physiology, disease, ecology, hygiene, public health, phylogeny, ontogeny, therapeutics, prevention, control, diagnosis, management, teaching, accident, and all other related concepts are deemed to be the manifestation of the fundamental category, 'Energy'. Here are some examples of the manifestation of [E] :

1. Linguistic *structure*
2. *Accidents* in coal mines
3. Social *pathology*
4. India's *Foreign Policy*
5. Library *Management*
6. *Eradication* of Malaria

5.4.4 Matter

The dictionary meaning of the term 'Matter' is that which occupies space.

It manifests as material and property. Its manifestation is rather more difficult to identify than that of Energy. The isolate ideass such as books, periodicals, mineral resources, building construction materials, and raw materials are deemed to be the manifestations of 'Matter'. Property isolates such as height, weight, volume and area are also regarded as manifestations of Matter. In the seventh edition of Colon Classification (Preview) the two important characteristics of Matter, i.e., material and property, have been regarded as two distinct facets, viz., Matter-Material [M-M] and Matter-Property [M-P]. Here are some examples of the manifestations of [M)]:

1. *Periodicals* in University libraries
2. Export of *Iron Ore.*
3. *Teakwood* for building construction
4. Painting on *canvas*
5. *Gold currency* in the Moghul period.

5.4.5 Personality

The fundamental category, 'Personality', is rather difficult to define. It is too elusive to be expressed in any definition. The dictionary meaning is that it is an integrated organisation of all the psychological, intellectual, emotional and physical characteristics of an individual. But this meaning is not helpful as it deals with only the human personality. The manifestation of personality can be found in both animate and inanimate things or objects. Personality can be identified by 'the method of residues'. If a particular manifestation is not of [T] or [S] or [E] or [M] then it can be regarded as the manifestation of Personality. But this method of identification is not infallible. In certain cases the residue isolate idea may by Personality, Matter or Energy.

But it is through experience and flair of the classificationist that the manifestation of personality in any given subject can be recognised. Here are some examples of the manifestations of Personality :

1. Introduction of *Special Libraries*
2. Psychology of *Children*
3. Diseases of *Lungs*
4. *Rural* Sociology
5. *Hindu* Mysticism.

5.4.6 Identification of Fundamental Categories

As stated above, it is through the experience and flair of the classificationists / classifiers that the identification of the fundamental categories is possible. The following exercise shows how these fundamental categories manifest in different subject fields. The following symbols are used in the example :

(MC) - Main class
[P] - Personality
[M] - Matter
[E] - Energy
[S] - Space
[T] - Time

1. Political Science (MC)
2. Geography (MC) of India [S]
3. Grammar [E] of Telugu [P] Language (MC)
4. Secondary [P] Education [MC] in India [S] brought upto 1980s [T]
5. Constitution [E] of Moon [P] ((MC) - Astronomy)
6. Classification [E] of Patents [M] in Special Libraries [P] in India [S] in 1984 [T]
7. Worship [E] in Hinduism [P] ((MC) - Religion)
8. Dreams [E] among children [P] ((MC) - Psychology)
9. Diseases [E] of respiratory system [P] ((MC) - Medicine)
10. Analytical [E] Chemistry (MC)
11. Rural [P] Sociology (MC) of India [S]
12. Muslim [P] Law (MC)
13. Designs [E] in Civil (P) Engineering (MC)
14. Migration [E] of Birds [P] ((MC) - Zoology)
15. Bredding [E] of horses [P] in Australia [S] ((MC) - Animal Husbandry)
16. Management [E] of life insurance [P] in India [S] brought upto 1970s [T]
17. Pathology [E] of flowering plants [P] ((MC) - Botany)
18. Cotton [P] Textile (MC) Printing [E]
19. Breath Contrl [E] in Hatha Yoga [P] ((MC) - Mysticism)
20. Planning [E] of City Dwellings [P] ((MC) - Town Planning)

Self-Check Exercise-2

(a) State the five fundamental categories.

Note : i) Write your answer in the space given below.

ii) Compare your answer with the model answer given at the end of this unit.

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(b) Under which category writing, reading, playing can be manifested.

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(c) State how one can identify the isolates under Personality facet.

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5.5 POSTULATE OF BASIC FACET

"Every compound subject has a Basic Facet, *(Prolegomena,* p. 402). The word groups, 'Compound Subject' and 'Basic Subject', need elucidation. 'Compound Subject' (CS) means a Subject with a basic subject (BS) and one or more isolate ideas as compounds.

e.g. 1. Psychology (BS) as against

Child Psychology (CS)

2. Economics (BS) as against Labour Problems

or Textile Industry (CS).

Basic Facet (BF) means Basic Class in the Idea Plane, Basic Subject in the Verbal Plane, and Basic Class number in the notational plane. This means the word groups, 'Basic Class' and 'Basic Facet' are used synonymously.

Identification of Basic Facet

It is necessary to know the schedules of a scheme for classification in order to identify the basic facet of a compound subject. Sometimes, the title of the documents is explicit enough to indicate the basic facet. But in some titles it is implict, while in others it is absent. Here are examples of the three possibilities :

S.No.	Indication	Title	Basic Facet
1.	Explicit	Treaties on Chemistry Dictionary of Psychology A Text Book of Physical Geography	Chemistry Psychology Geography
2.	Implicit	Structure of Classification Disease of Lungs Paddy Cultivation	Library Science Medicine Agriculture
3.	Absent	Shroud of Mystery The Twilight Seas Inside the Cocaine Wars	Religion Zoology Sociology

If the titles are oblique or fanciful without expressing the subject, one has to go through the contents page, preface, introduction or even the entire book determine the basic facet. Most of the works in literature, classics and popular books in various subject fields come under this category.

Self-Check Exercise-3

Identify the Basic Subject (BS) in the following titles :

a) Studies in Paper Industry

b) India's Foreign Policy

c) Eradication of Poverty in Rural Areas

d) Hindu Personal Law

e) Teaching Mathematics in Secondary Schools

Note : i) Write your answer in the space given below.

ii) Compare your answer with the model answer given at the end of this unit.

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5.6 POSTULATE OF ISOLATE FACET

After identifying the basic subjects, the anlalysis of isolate ideas going with basic classes has also to be done logically and systematically.

"Each isolate facet of a compound subject can be deemed to be a manifestation of one and only one of the five fundamental categories" *(Prolegomena,* p. 403). It is easy to recognise the isolate ideas which appear as manifestations of the fundamental categories like Time, Space, Energy and Matter. Any isolate idea which is not found to be the manifestation of any of these four categories, such isolate ideas should be considered as the manifestation of Personality. Here are some examples of isolate facets.

Basic Class	Facets					
1	2	3	4	5	6	7
Library Science	Type of Library (Research Library)	Materials (Documents)	Activity (Classi-fication)	City (Delhi)	Year (1987)	
Chemistry	Substance (alcohol -liquid)	Property (Volatility)	Reaction (Combus-tion)	Analysis (Opera-tion)	Device (Burette)	
Botany	Natural Group of Plants (Flower-ing plant)	Property (Colour, odour)	Structural Study Morpho-logy)	Country (India)	Year (1986)	
Agriculture	Crops (Rice)	Property (Protein content)	Operation (Harvest-ing)	Machinery (Tractor)	Country (Burma)	Year (1985)
Medicine	Organs (Lungs)	Structural Study (Anatomy)	Disease (Cancer)	Treatment (Oral)	Drug (Strepto-mycin)	
Education	Educand (Children)	Subjects Taught (Maths)	Teaching (Technique (Question-Answer)	Equipment (slide (Projector)	City (Delhi)	Year (1987)
History	Community (Indians)	Activities (Freedom (Struggle)	Period (1910-1947)			
Sociology	Social Groups	Activities (Marriage)	Welfare Activities	Country (Pakistan)		Year (1990)

Identificaiton of Isolate Facets

The identifiction of Isolates Facets in a given subject may either be explicit or implicit, hidden or absent. Sometimes the basic subject of a document helps in identifying the isolate facet. Experience and flair of the classificationist help in identifying isolate facets *in a subject*. Here are some examples.

Title		Basic Facet (BF)	Isolate Facets of (IF)
Explicit			
1.	Safety Methods in Gold Mines	Mining (BF)	Gold [P] Safety Methods [E]
2.	Surveying of Rail Road Engineering	Engineering (BF)	Rail-Road [P] Surveying [E]
3.	Teaching Techniques in Secondary Educaiton.	Education (BF)	Secondary [P] Surveying [E]
Implicit : (The implied Facets are in italics)			
1.	Examination System	*Education* (BF)	*Educaitonal Measurement* [E] Examination [E]
2.	Collective Bargaining	*Economics* (BF)	Textile Industry [P] *Industrial Relations* [E] Collective Bargaining [E]
3.	Correctional Methods for Children	*Sociology* (BF)	Children [P] *Crime* [E] Correctional Methods [E]
Hidden : (The hidden Facets are in italics)			
1.	Rural Development in India	*Sociology* (BF)	*Personality* [E] Rural [P] Development [E]
2.	Medical Therapeutics	*Medicine* (BF)	Therapeutics [E] *Disease* [E]
3.	Kalidasa	*Literature* (BF)	Kalidasa [P] *Drama* [P], *Sanskrit* [P]

Self-Check Exercise-4

Identify the Basic Facet (BF) and Isolate Facet (IF) in the following titles :

a) Cataloguing of Books in University Libraries in India in 1980s.

b) Exploration of Diamonds in Andhra Pradesh

c) Distillation Process in Petroleum

d) Prevention of Drinking Habits among Urban People in Bombay City.

e) Treatment of Lung Diseases

Note : i) Write your answer in the space given below.

ii) Compare your answer with the model answer given at the end of this unit.

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5.7 CONCEPT OF ROUNDS AND LEVELS

In the compound and complex subjects, the five fundamental categories manifest more than once in the form of facets. This led Ranganathan to formulate the concept of 'Rounds' and 'Levels' and enunciated certain postulates. Through Postulates of Rounds and Levels the number of fundamental categories have been restricted to five and only five, whatever may be the number of manifestations of each fundamental category. The concept of 'Round' denotes cyclic recurrence of fundamental categories in the facet analysis of a subject. The concept of 'Level' denotes recurrence of one and the same fundamental category within a round. These two concepts are discussed briefly, quoting respective postulates with examples.

5.7.1 Manifestation of Rounds : Postulate of 'Rounds' for Energy

"The fundamental category, 'Energy' [E] may manifest itself in one and the same subject more than once. The first manifestation is taken to end Round 1 of the manifestation of the three fundamental categories, 'Personality', 'Matter' and 'Energy'. The second manifestation is taken to end Round 2 and so on" *(Prelegomena,* p. 410). These manifestations of Energy are represented by the following symbols :

[E]	Round 1	Energy	Facet
[2E]	Round 2	„	„
[3E]	Round 3	„	„

5.7.2 Postulate of 'Rounds' for Personality and Matter

"Each of the fundamental categories, 'Personality' and 'Matter', may manifest itself in Round 1, and Round 2, and so on" *(Prolegomena,* p. 410.)

[P]	Round 1	Personality Facet [P]	
[2P]	Round 2	„	„
[3P]	Round 3	„	„
[M]	Round 1	Matter Facet [M]	
[2M]	Round 2	„	„
[3M]	Round 3	„	„

5.7.3 Postulate of 'Rounds' for Space and Time

"Oridinarily any of the fundamental categories, 'Space' and 'Time' may manifest itself only in the last of rounds in a subject" *(Prolegomena* p. 410). These manifestations are represented by the symbols [S] and [T].

Example :

The Manifestation of the fundamental categories in the form of rounds is demonstrated by this example :

Ultra Voilet Ray Treatment of Virus Infection of Liver in Andhra Pradesh during 1980s.

In the title mentioned above the Basic class (BC) is not stated explicitly. But implicitly the (BC) is Medicine. The term, 'virus infection', is a derived composite term. Hidden in this is the manifestation of 'Energy' and 'Personality'. This term should be broken into expressed terms i.e. disease caused by virus infection.

As a result of this elucidation, the name of the subject becomes "*Ultra Voilet Ray Treatment of the disease of Liver caused by Virus Infection in Medicine in Andhra Pradesh brought upto the 1980s*". This is called full title or expressed title.

5.8 ANALYSIS OF THE TITLE INTO FACETS

We have to find out from the word groups in the above mentioned title which are the manifestations of successive fundamental categories. As already indicated, the fundamental category, 'Personality' is the most elusive and it should be identified through the method of 'residues', i.e. after all other facets have been found out the remaining one. The process should start from the easiest facet to the most difficult one, i.e. from Time to Space, Space to Energy, and Energy to Matter.

In the above mentioned title the word groups brought upto 1980s is [T] and Andhra Pradesh [S]. Similarly, the word groups, (1) *Treatment* is [E] and (2) *Disease* [E]. There is no manifestation of Matter in this title. Therefore, the word groups which are still left are : (1) Ultra Voilet Ray, (2) Liver, (3) Virus Infection, and (4) Medicine. Of these Medicine is (B.C.). Then only three word groups are left for identificaiton. None of these are manifestations of [T], [S], [E] or [M]. Therefore, they must be taken to be the manifestation of 'Personality'. As a result of this analysis, the word groups in the above mentioned title and the manifestations of the fundamental categories are as follows :

Ultra Voilet Ray [P], Treatment [E], of Disease [E], of Liver [P], Caused by Virus Infection [P], in Medicine (BC), in Andhra Pradesh [S] brought upto 1980s [T].

5.9 ARRANGEMENT OF FACETS

In the example given above we find that the fundamental categories, [P] and [E], occur more than once. There are 3 [P]s and 2[E]s. These facets should be arranged in a helpful sequence. On the basis of reasoning and the commonsense we can say that 'Treatment' cannot arise unless there is 'Disease'. Therefore, the 2 [E]s should be arranged in the sequence of 'Disease' and 'Treatment'. We must now turn to the sequence of 3 [P]s in relation to 2[E]s: 'Ultraviolet ray' will not be thought of unless we think of 'Treatment'. Therefore [P] *'Ultra Violat Ray'* should succeed [E] *'Disease'*. Again, *'Treatment'* cannot begin until the cause of disease is determined. Therefore, virus infection [P] should precede the *Treatment* [E]. This fixed the position of Virus *infection* [P] between the 2[E]s, i.e. *'Disease'* and *'Treatment'*. Then the place for the remaining [P] *'Liver'* need to decided. The *disease* in question is affecting the *liver.* Therefore, [P] *'liver'* should come before [E] *'disease'*. As a result of this reasoning, the sequence of facets is *Medicine* (BC) *Liver* [P] *Disease* [E] - *Virus infection* [P] - *Treatment* [E] *Ultra Violet Ray* [P] - *Andhra Pradesh* [S] - *1980s* [T].

5.10 MANIFESTATION OF LEVELS

"Any of the fundamental categories, 'Personality' and 'Matter' may manifest itself more than once in one and the same round within a subject and so is the case with 'Space' and 'Time' in the last rounds" *(Prolegomena,* p. 411). The manifestation of 'Personality' [P] and 'Matter [M] in one and same round within a subject are symbolically expressed as :

[P]	=	Round 1 level 1 Personality Facet
[P2]	=	Round 1 level 2 „ „
[2P]	=	Round 2 level 1 „ „
[2P2]	=	Round 2 level 2 „ „ and so on.
[M]	=	Round 1 level 1 Matter Facet
[M2]	=	Round 1 level 2 „ „
[2M]	=	Round 2 level 1 „ „
[2M2]	=	Round 2 level 2 „ „ and so on.

As the fundamental categories, Space [S] and Time [T], occur only in the last round of the subject there is a need to indicate the 'rounds' in their names or their symbols. This is symbolically represented as :

[S]	=	Level 1 Space Facet
[S2]	=	Level 2 „ „
[T]		Level 1 Time Facet
[T2]	=	Level 2 „ „

There is no 'level' in the case of fundamental category, 'Energy, as it occurs only once within a round.

The following example will demonstrate the manifestation of fundamental category, 'Personality', in the form of 'levels'.

Critical Evaluation of Sakuntalam

The title is not explicit. Some facets are hidden in the title. We have to supply 'Literature' as the name of the Basic Class (BC). Next, we have to recall that 'Sakuntalam' implies that it is a work of *Kalidasa* in the literature of *Sanskrit* language.

i) Analysis of the Subject

In this subject, there is obviouslay no [T] or [S] or [M], *Critical evaluation* is [E]. The isolate idea denoted by respective residual word groups has to be taken as the manifestation of Personality [P]. The facet analysis of the full name of the subject gives the result *Critical evaluation* [E] of *Sakuntalam* [P] of *Kalidasa* [P], the dramatist [P] in the Literature (BC) of *Sanskrit* language [P]. This subject indicates 1 [E] and 4 [P]. This is a new type of phenomena not found generally in other subjects

ii) Transformation of the subject

The sequence of facets in the subject given above can be decided on the basis of certain assumptions. Critical evaluation presupposes the work to be evaluated. Therefore, Critical evaluation [E] should come only after Sakuntalam [P]. Similarly, 'Sakuntalam' presupposes Kalidasa [P], Kalidasa presupposes drama [E] and drama presupposes Sanskrit language [P]. This transformaiton of the subject is : Literature (BC) - Sanskrit [P], Drama [P], Kalidasa [P], Sakuntalam [P] and Critical evaluation [E]. In this subject there are 4 [P]s in the first round itself. Therefore, the facet analysis for the subject should be taken as : Literature (BC), Sanskrit [P], Drama [P2], Kalidasa [P3], Sakuntalam [P4] and Critical evaluation [E].

Self-Check Exercise-5

Analyse the following titles on the basis of Rounds and Levels of manifestation and arrange the Facets in the light of Postulates of the two concepts.

a) Treatment of Lung Cancer by Radium Therapy.

b) Prevention of alcoholism in rural areas through legislation.

c) Cold storage of cow milk

d) Tagore's *Geetanjali*

e) Union Catalogue of books available in the libraries of Andhra Pradesh.

Note : i) Write your answer in the space given below.

ii) Compare your answer with the model answer given at the end of this unit.

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5.11 SUMMING UP

Documents contain knowledge that is multidimensional and multifaceted. So, when the documents are arranged in a linear order on the library shelves the interrelationship of subjects cannot be fully satisfied because the same document cannot be physically placed at different places on the shelves. This is the real problem in library classification.

Instead of arbitrary enumeration of subjects in a scheme for classification if we can find out the isolate ideas which combine themselves to form the subject context of a document, we may be able to retain the relationship between the isolate ideas in the class number that we can construct for the document. This enables the achievement to a large extent of a helpful arrangement of documents on the shelves. Ranganathan made such an attempt in his theory on library classification through suggesting a "Postulational approach".

Postulational approach enunciated by Ranganathan helped classificationists as well as classifiers. 'Postulate of Fundamental Categories' says that there are only five Fundamental Categories, namely, Time, Space, Energy, Matter and Personality. According to him each facet of a subject and each division of a facet may be regarded as a manifestation of the fundamental categories.

The analysis of subjects into Facets and arranging them according to PMEST is another important aspect discussed in this Unit. The examples quoted clearly helps you in deciding the sequence of Facets in a compound/complex subject. These postulates and principles clearly demonstrate their importance in library classification.

5.12 MODEL ANSWERS

1. a) Postulational approach
   b) An assumption or statement
   c) Helps to have a sound basis of theory and practice of classification.

2. a) Time, Space, Energy, Matter and Personality.
   b) Energy.
   c) By the method of residues.

3. a) Paper Industry
   b) Foreign Relations
   c) Poverty (Sociology)
   d) Law
   e) Secondary Education.

4. a) Library Science (BF), University (IF) Cataloguing (IF) Books (IF) India (IF) 1980's (IF).
   b) Geology (BF), Exploration (IF), Diamonds (IF), Andhra Pradesh (IF).
   c) Petroleum (BF), Distillation Process (IF).
   d) Sociology (BF), Prevention (IF), Drinking Habits (IF), Urban People (IF), Bombay (IF),
   e) Medicine (BF), Lung (IF), Diseases (IF), Treatment (IF).

5. a) Medicine (BS), (implicit), Lung [P], Cancer [E], Therapy [2E], Radium [3P],
   b) Sociology (BS), Alcoholism [E], Prevention [2E], Legislation [3P], Rural Areas [S].
   c) Animal Husbandry (BS), Cow [P], Milk [P2], Storage [E].
   d) Literature (BS), Bengali [P], Poetry [P2], Rabindranath Tagore [P3], Gitanjali [P4].

5.13 ASSIGNMENTS

1. What is the Postulational approach to library classification ? Discuss its need and advantages.
2. Briefly explain the Postulates pertaining to five fundamental categories (FFC).
3. Identify the main class (MC) and the five fundamental categories (FFC) in the following titles :
   a) Cataloguing manuscripts in the University libraries
   b) Drainage in Gold Mines
   c) Storing of Wheat in Punjab
   d) Text Book of Sanskrit Grammer
   e) Labour Problems in Steel Industry
   f) Alcoholism in Urban Andhra Pradesh
   g) Digestive Disorders in Cows
   h) Physical Chemistry of Gases
   i) Public Finance in underdeveloped countries
   j) Income Tax law in India.
4. Discuss the postulates of 'Basic Facet and 'Isolate Facet' with examples from Science, Social Science and Humanities.
5. Explain the Postulate of 'Rounds' of manifestation of Energy with examples.
6. What is 'Levels' of manifestation ? Which are the Fundamental Categories that manifest in the form of 'Levels' in a compound subject ?

5.14 RECOMMENDED BOOKS

Krishna Kumar. *Theory of Classification.* New Delhi : Vikas, 1979.

Ohdedar AK and Sengupta B. *Library Classification.* Calcutta : The World Press, 1977.

Raju, A.A.N. *Decimal, Universal Decimal and Colon Classification : A Study in Comparison.* Delhi : Ajanta Publicaitons, 1984

Ranganathan, S.R. *Colon Classificaiton,* 6th ed. Bombay : Asia, 1960.

Ranganadhan, S.R. *Elements of Library Classification* 3rd ed. Bombay : Asia Publishinhg House, 1962.

Ranganathan, S.R. *Prolegomena to Library Classification* 3rd ed. Bombay : Asia Publishing House, 1967.

5.15 GLOSSARY

Postulates : Postulates are the certain assumptions which are helpful in carrying out the process of classification of documents. These assumptions are helpful in tackling the problem of mapping the universe of knowledge.

Fundamental Categories : In Classification, categories of facets which are to be applicable to any subject field. For ex : S.R. Ranganathan proposed five fundamental categories of facets (Personality, Matter, Energy, Space & Time) as the basis of his Colon Classification.

Basic Facet : 1. In Classificaiton, the set of sub-classes produced when a subject is divided by a single characteristic, 2. Any of a number of aspects of a subject.

Isolate Facet : In faceted classification, a concept which can be placed in a number of different contexts and which in isolation is not considered to be a subject, when placed in the context of a facet of a basic class, the isolate becomes a focus of that facet.

Rounds : The concept of 'Rounds' denotes the cyclic recurrence of fundamental categories in the facet analysis of a subject.

Levels : The concept of 'Levels' denotes recurrence of one and the same fundamental category within a round.

5.16 MODEL EXAMINATION QUESTIONS

I. ESSAY QUESTIONS

1) What do you understand by 'Postulational Approach' ? Discuss its need and advantages in library classification.

2) What are the Fundamental Categories ? Explain each category with suitable examples.

II. SHORT NOTES

a) Basic Facet

b) Isolate Facet

c) Rounds and Levels

UNIT-6 : PRINCIPLES OF FACET SEQUENCE AND HELPFUL SEQUENCE

Contents

6.0 AIMS AND OBJECTIVES

After recognizing the occurance of facets in a compound subject, the next step is to decide the helpful sequence of such facets. This Unit briefly deals with the Principles of Facet Sequence and Helpful Sequence.

After going through the Unit; you will be able to :

- explain postulates and principles of facet sequence;
- enumerate the postulates and principles of helpful sequence; and
- apply the eight steps involved in Practical classification for achieving class number to a specific subject.

6.1 INTRODUCTION

In the previous Unit, you have been exposed to the postulational approach to faceted classification. Ranganathan's postulate of Fundamental Categories, their manifestation into Rounds and Levels was explained with examples. You have also been introduced to the method of content analysis of documents using the technique of facets analysis and fitting the facets into the framework of Fundamental Categories.

In this Unit, we extend the study of sequencing the analysed facets of a document. These analysed facets should be arranged in a rational and helpful order that is most helpful for displaying documents on library shelves, for arranging entries in a catalogue and entries in a bibliography. For achieving the objective, Ranganathan has enunciated a number of postulates and formulated a number of principles and pronounced their application in Colon Classification. These sets of postulates and principles are explained with examples.

Other systems of classification also have been using these techniques of analysis and synthesis for their design and arrangement of subjects.

6.2 FACET SEQUENCE

Facet analysis and synthesis are the two processes in classifying a subject. The analysed facets of a document should be arranged in a sequence. Such a sequence is necessary to obtain a rational order of the analysed facets. The sequence of different kinds of facets of a compound subject are determined by means of the postulates.

6.2.1 Postulates of Facet Sequence

For determing the facet sequence (FS) and deriving a helpful and logical order of facets, Ranganathan enunciated certain postulates. These are :

i) Postulate of first facet

ii) Postulate of concreteness

iii) Postulate of FS within a Round

iv) Postulate of FS within the last Round

v) Postulate of Level cluster.

Let us examine these one by one.

i) Postulate of First Facet

In a compound subject the Basic Facet should be the first facet *(Prolegomena,* p. 142). As stated earlier every compound subject should have a Basic Facet. This BF may be explicit, implicit or absent. Every isolate facet that can form a compound subject going with a BF should be arranged helpfully. Let us consider the following example :

Management of Iron Industry in India in 1990s :

In this

Management [E]

Iron Industry [P]

India [S]

1990s [T]

Economics (BF). In this example the basic facet is implicit.

As per the Postulate of First Facet the basic subject should be given first place. The sequence therefore, is : *Economics* (BF), *Iron Industry* [P], *Management* [E], *India* [S], and *1990s* [T].

ii) Postulate of Concreteness

The five fundamental categories fall into the sequence of PMEST when arranged according to their decreasing concreteness. The sequence of these five categories according to their relative concreteness conform to the approach of the majority of readers who visit the libraries for specific dosuments. Whatever may be the sequence of manifestation of these categories in a compound subject, while constructing the class number they should be arranged in the sequence of PMEST only. Let us observe the following example.

Consultation of Patents in Special Libraries in India in 1989.

The basic facet for the above mentioned title is Library Science which is implicit. On the basis of facet analysis the title yields the following facets :

Library Science (BF), *Consultation* [E], *Patents* [M], *Special Libraries* [P], *India* (S), *1989* (T).

As per the above mentioned Postulate the sequence of the Fundamental Categories should be :

Library Science (BF), *Special Libraries* [P], *Patents* [M], *Consultation* [E], *India* [S], *1989* [T].

iii) Postulate of Facet Sequence within a Round

"In any round of facets of a Compound Subject in which each of any of the fundamental categories - Personality, Matter and Energy - occurs only once, their sequence should be : Personality Facet, Matter Facet and Energy Facet" *(Prolegomena,* p. 142). As per this Postulate, if any [P], [M] and [E] occur in any round they should be arranged according to [P], [M] and [E].

Eg. *Maintenance of Filmstrips in a Technical Library.*

The basic facet for this title is library science which is implicit. The other isolate facets in the title are *Maintenance* [E], *Filmstrips* [M], *Technical Library* [P], *Library Science* (BF). As per the postulate 1 to 3 stated above the sequence of facets in the above mentioned are : *Library Science* (BF), *Technical Library* [P], *Filmstrips* [M], *Maintenance* [E].

iv) Postulate of Facet Sequence within the Last Round

"In the last Round of facets of a Compound Subject, in which each of the fundamental categories other than Energy may occur and occur only once, the sequence of facets should be Personality Facet, Matter Facet, Space Facet, and Time Facet" *(Prolegomena,* p. 142). For e.g. *Bronze Iconography in India in the 12th Century.*

The Basic Facet for the above mentioned title is *Sculpture* which is implicit. The other isolate facets in it are : *Bronze* [M], *Iconography* [P], *India* [S], *12th Century* [T]. In this title there is no manifestation of the fundamental category, Energy. As per the above mentioned postulate the sequence of facets of the compound subject are : *Sculpture* (BF), *Iconography* [P], *Bronze* [M], *India* [S], *12th Century* [T].

v) Postulate of Level Cluster

"Facets of different levels of the same fundamental category within a Round of Facets in a Compound Subject should be kept together" *(Prolegomena,* p. 412). As stated, the fundamental categories, [P], [M], [S], [T], manifest in the form of Levels in a compound subject within a Round. If this is so, different levels of the four fundamental categories should be kept together. Let us observe the following example :

Library Catalogue of Sanskrit Manuscripts

The basic facet for the title given above is *General Bibliography.* The other isolate facets in the compound subjects are : *Library Catalogue* [P], *Sanskrit* [P], *Manuscripts* [P], *General Bibliography* (BF). The sequence of facets on the basis of the Principle of decreasing extension is *General Bibliography* (BF). There is only one fundamental category viz., 'Personality', which manifested in the form of 'levels' in one and the same round.

Samples of Examples in Facet Sequencing

The following examples of compound subjects indicate only one isolate facet :

S.No.	Subject	Facet Sequence
1.	Educaiton (BF)	Education (BF)
2.	Education (BF) in 1980s [T]	Education (BF), 1980s [T]
3.	Education (BF) in India [S]	Education (BF) in India [S]

4.	Teaching Techniques [E] in Education (BF)	Education (BF), Teaching Techniques [E]
5.	Visual Materials [M] in Education (BF)	Education (BF), Visual Materials [M]
6.	Secondary [P] Educaiton (BF)	Education (BF), Secondary [P]

In these six titles mentioned above the basic facet, Education, is common. The sequence of facets is to be determined by the respective isolate facets. As per the Postulate of Concreteness, the six titles are arranged in the increasing sequence of concreteness.

The following examples of compound subjects indicate many facets :

S.No.	Subject	Facet Sequence
1.	Sociology(BF)	Sociology (BF)
2.	Sociology((BF) in 1980s [T]	Sociology (BF), 1980s [T]
3.	Sociology (BF) in India [S] in 1960s [T]	Sociology (BF) in India [S] in 1960s [T]
4.	Sociology Pathology [E]	Sociology (BF), Pathology [E]
5.	Social Pathology [E] in 1960s [T]	Sociology (BF), Pathology [E] 1960s [T]
6.	Social Pathology [E] in India [S] in 1960s [T]	Sociology (BF), Pathology [E], India [S], 1960s [T]
7.	Prevention [E] of Social Pathology [E] in India [S] in 1960s [T]	Sociology (BF), Pathology [E], Prevention [2E], India [S], 1960s [T].
8.	Prevention [E] of Alcoholism [P] in India [S] in 1960s [T]	Sociology (BF), Social Pathology [E]. Alcoholism [2P], Prevention [2E], India [S], 1960s [T].
9.	Prevention [E] of Alcoholism [P] through Police [P] in India [S] in 1960s [T]	Sociology (BF), Social Pathology [E], Alcoholism [2P], Prevention [2E], Police [3P], India [S], 1960s [T].
10.	Prevention [E] of Alcoholism [P] through Police [P] Rural Areas [P] of India [S] in 1960s [T]	Sociology (BF), Rural Areas [P] Pathology [E], Alcoholism [2P], Prevention [2E], Police [3P], India [S], 1960s [T].

In these examples compound subjects with many facets with more than one 'Round' is cited. These are arranged on the basis of postulates for facet sequence discussed above.

Self-Check Exercise-1

List out the Postulates of Facet Sequence as enunciated by S.R. Ranganathan.

Note : i) Write your answers in the space given below :

ii) Compare your answers with the model answers given at the end of this Unit.

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6.2.2 Principles for Facet Sequence

The Postulates for facet sequence described above are helpful in determining the sequence of isolate ideas in a compound subject in such cases where each isolate idea is the manifestation of different fundamental categories. The postulates do not help in determining the sequence of two or more isolate ideas which might be deemed to be the manifestation of the same fundamental category. If we want to decide the sequence between two isolates or [P] or [M] or [E] or [S] or [T], the postulates stated in the preceding paras are not helpful. Therefore, Ranganathan has since 1962 formulated certain principles to guide the classifier in determining the sequence of isolate ideas which are the manifestation of the same fundamental category in a compound subject. These principles are known as 'Principles for Facet Sequence' which are briefly described in the following paras.

i) Wall-Picture Principle

"If the facets 'A' and 'B' of a subject are such that the concept behind 'B' will not be operative unless the concept behind 'A' is conceded, even a mural picture is not possible unless the wall exists to draw upon, the facet 'A' should precede the facet 'B', *(Prolegomena,* p. 412). This principle has become one of the fundamental principles of a facet sequence. There are numerous examples in Colon Classification where the sequence of facets in a compound subject going with a basic subject have been decided on the basis of this principle. Take for example, a compound subject like "Prevention of Accidents in Gold Mines". In this compound subject the Energy facet is manifesting more than once in the form of 'Prevention' and 'Accidents'. Here the concept behind the term, ("Prevention") is not operative unless the concept behind the term 'Accident', is conceded. Therefore, the sequence of facets should be 'Accidents', and 'Prevention'. In this example, 'wall-picture' had determined the Round to which the concept, 'Accident', should be assigned as the one preceding the energy facet, 'Prevention'. Thus 'Accident' comes under [E] and Prevention under [2E].

ii) Whole-Organ Principle

"If in a subject, facet 'B' is an organ of Facet 'A', then 'A' should precede 'B' (*Prolegomena,* p. 427). The words, 'whole' and 'organ' need some explanation, The word, 'whole has been defined as in sense 1, "as applied to a Universe of Entities, all the entities taken together. Sense 2 "as applied to a typical entity of a Universe of Entities, the complete - the entire - entity". The word 'organ', has been defined as a "Functional part of a typical entity of the Universe of Entities" (*Prolegomena,* p. 422). Take for example, "Electronics Commission, Government of India". The facet, 'Electronics Commission', is a sub-organ of the Department of Electronics which is an organ of the Ministry of Science and Technology. The facet, Ministry of Science and Technology, is an organ of Government of India. Therefore, the sequence of the four facets in this compound subject should be Inida [P], Ministry of Science and Technology [P2], Department of Electronics [P3], and Eelctronics Commission [P4]. In this example, the fundamental category, 'Personality', manifests in the form of levels in one and the same Round.

iii) Cow-Calf Principle

"If a facet 'A' and another facet 'B' belonging to the same subject are not to be separated, though they are distinct from each other and thus separable, A and B should be kept together in the same Round, even as a milch cow and its unweaned calf are not separately sold out though they are distinct entities and thus separable, but are kept together in the possession of the same owner" (*Prolegomena,* p. 427). Take for example "Formulation of Development Plans for Urban Areas of Andhra Pradesh". In this compound subject the three facets, 'Andhra Pradesh', 'Urban Areas' and 'Development Plans' are not to be separated, though separable and put into different rounds. It would be more helpful if the three facets are put together in Round one, i.e.. before the energy facet, 'Formulation' or after it. It is not helpful to put any one of them in Round 1 and the other two in Round 2. This principle directs that the three facets should be in one and the same round. According to this principle, the three facets should be put in Round one. The sequence of facets should be Andhra Pradesh, Urban Areas, Development Plans and Formulation.

iv) Actand-Action-Actor-Tool Principle

"If in a subject, facet 'B' denotes action on facet 'A' by facet 'C', with facet 'D' as the tool, then the four facets shall be arranged in the sequence of A,B,C,D" (*Prolegomena*, p. 428). Take for example : action is polughing, actand is land, the actor is farmer, and the tool is tractor. As per the above mentioned principle the sequence of facets should be land, ploughing farmer and tractor.

The three principles, viz. Whole-Organ, Cow-Calf, Actand-Actor-Action-Tool are corollaries to Wall-Picture Principle. In addition to these principles, Ranganathan also formulated another principle, "Commodity-Raw Material-Transformation-Transformer -Tool" as a corollary to the Wall-Picture Principle.

Self-Check Exercise-2

i) List out the Principles of Facet Sequence

ii) To which Principles of Facet Sequence the following titles belong :

a) Indian Parliament

b) Treatment of Lung Diseases

c) Fuinctions of Prime Minister of India

d) Sowing Seeds by the Farmer with Tractor.

Note : i) Write your answers in the space given below.

ii) Compare your answer with the model answers given at the end of this Unit.

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6.3 HELPFUL SEQUENCE

Library classification deals with the classification of documents while doing so they must be classified by their ultimate class. The ultimate class of the subject of a document is the class of the smallest extension. The classes, therefore, need to be arranged in a definite sequence. "The sequence of the classes in an array of classes, and of the ranked isolates in an array of ranked isolates, should be helpful to the purpose of those for whom it is intended" (*Prolegomena,* p. 163). Now the question comes what is a helpful sequence ? Even within a small field, there

can be various helpful sequences. What may be found to be most helpful sequence to one category of users may turn out to be less than helpful to another category of users. Under these circumstances, the practical solution is to take care of the majority point of view.

6.3.1 Postulates of Helpful Sequence

Helpful sequence facilitates the arrangement of subjects from the specific subject to narrower subjects. The subjects, therefore, should be arranged in a helpful sequence so that user approaching the sequence from a broader or narrower angle is led, by the sequence itself, to the specific subject. The sequence will present before the users the full field of their interest in a logical order. This will help them in identifying "what they want". This can be identified by means of APUPA arrangement.

APUPA Arrangement

Ranganathan refers to the focal point of a reader's main interest as an umbral region. According to him, the user would "like to have fanned out on either side of the umbral region the subjects, having successfully a decreasing bearing on the umbral subject. The two regions - on either side of the umbral region - may be called his penumbral regions, and the subjects in them are penumbral subjects. The penumbral regions will ultimately thin out into the alien regions on either side" *(Prolegomena,* p. 383-84). As the user examines the total region, his eyes will successively pass through the Alien, the Penumbral, the Umbral, and again the Penumbral and Alien subjects. This arrangement is referred to as the APUPA arrangement.

The order of the subjects can be helpful in determining the most useful sequence. According to Bliss, in order to cater to others, alternative locations and alternative schedules may be provided. In order to achieve a helpful sequence (helpful to the majority of users, in array, we can use the following principles of a helpful sequence.

Self-Check Exercise - 3

Expand the abbreviation APUPA. How APUPA pattern is helpful in arranging documents on the shelves ?

Note : i) Write your answers in the space given below.

ii) Compare your answer with the model answers given at the end of this Unit.

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6.3.2 Principles of Helpful Sequence

The following are the guiding principles available for helpful sequence :

(i) (a) Principle of Later-in-Time;
(b) Principle of Earlier-in-Time.

(ii) (a) Principle of Later-in-Evolution;
(b) Principle of Earlier-in-Evolution.

(iii) Principle of Spatial Contiguity

(iv) (a) Principle of Increasing Quantity;
(b) Principle of Decreasing Quantity;

(v) (a) Principle of Increasing Complexity, or Principle of Decreasing Simplicity;

(b) Principle of Decreasing Complexity, or Principle of Increasing Simplicity.

(vi) Principle of Traditional or Canonical Classes

(vii) (a) Principle of Decreasing Literary Warrant

(b) Principle of Increasing Literary Warrant

(viii) Principle of Alphabetical Sequence

i) Principle of Later-in-Time

"If the subjects in an array of subjects or the isolates in an array of isolates have originated in different times, they should be arranged in a parallel progressive time sequence, except when any other overwhelming consideration rules it out". (*Prolegomena*, p. 184).

The chronological device followed in Colon Classification automatically satisfies the principle of later-in-time. Majority of the schemes of classification does fulfil this principle. For eg. :

Subject	DDC (18th edition)	UDC	LC	CC(6th edition)	BC	RIC
Stratigraphy	551.7	551.7	QE724/ 760	H5	DI-DJ	QT
Archeozoic	551.712	551.71	QE724	H51	DII	QTB
Primary	551.72-551.75	551.73	QE725	H52	DIM	QTC
Secondary	551.76-551.77	551.76	QE731	H53	DJA	QTJ
Tertiary	551.78	551.78	QE735	H54	DJN	QTN
Quaternary	551.79	551.79	QE741	H55	DJT	QTR

The above example shows that the principle of later-in-time is satisfied by the six schemes in the subject of stratigraphy.

ii) Principle fo Later-in-Evolution

"If the subjects in an array of subjects or the isolates in an array of isolates belong to different stages of evolution, they should be arranged parallel to the evolutionary sequence, except where any other overwhelming consideration rules it out" (*Prolegomena*, p 185).

The later-in-time or earlier-in-time sequence is applied when events have occurred at different times and there may be no relationship. But in the evolutionary sequence, events evolve one from the other (the one being dependent on the other).

Subject	DDC (18th edition)	UDC	LC	CC(6th edition)	BC	RIC
Botany	581	58	QK	I	F	TJ
Thallophyta	589	582.22	QK564/635	I2	FLA	TJK
Bryophyta	588	582.32	QK534/563	I3	FMB	TJG
Pteridophyta	587	582.35	QK520/532	I4	FMJ	TJB
Gymnosperm	585	582.42	QK495.G9	I6	FNA	TFJ
Monocotyledon	584	582.52	QK643.M7	I7	FT	TI
Dicotyledon	583	582.61	QK643.D7	I8	FOE	TG/TH

DDC, UDC and CC satisfy the principle of later-in-evolution completely. Other schemes nearly conform to the principle.

iii) Principle of Spatial Contiguity

"If the subjects in array of subjects or the isolates in array of isolates occur contiguously in space roughly along a unidirectional line or a radial line, or a circle - they should be arranged on a parallel spatial sequence, except when any other overwhelming consideration rules it out" (*Prolegomena,* p. 187). For example, in the arrangement of states in India, they should be arranged as they occur in space. Starting from the south we can arrange them as follows :

Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra, Madhya Pradesh, etc.

The above principle is a bundle of principles, as listed below :

a) Entities along a vertical line
   - i) Principle of bottom-upwards, and
   - ii) Principle of top-downwards.

b) Entities along a horizontal line
   - i) Principle of left-to-right;
   - ii) Principle of right-to-left;
   - iii) Principle of back-to-front, and
   - iv) Principle of front-to-back.

c) Entities along a circular line
   - i) Principle of clockwise direction, and
   - ii) Principle of anti-clock wise direction.

d) Entities along a radial line
   - i) Principle of periphery to centre, and
   - ii) Principle of centre to periphery

e) Distance from a point
   - i) Principle of away-from-position or increasing distance, and
   - ii) Principle of decreasing distance, and

f) Geographical contiguity.

There are six groups of principles belonging to the principle of spatial contiguity. It will be noted that principles occur in antithetic pairs (for example the principle of clockwise direction). A choice will have to be made between a pair, one of which may be found applicable. The choice will depend upon the context. However, if in an antithetic pair both are equally helpful, either may be chosen.

iv) Principle of Increasing Quantity

"If the subjects in an array of subjects or the isolates in an array of isolates admit of quantitative distinction, they may be arranged according to their increasing quantity, if it is helpful" (*Prolegomena,* p. 192). For example the students in a class room can be arranged according to their age in the increasing manner.

Similarly, the principle of decreasing quantity directs that, "If the subjects in an array of subjects or the isolates in an array of isolates admit of quantitative distinction, they may be arranged according to their decreasing quantity, if it is helpful" (*Prolegomena,* p. 192).

For example : World Library / Regional Library / National Library / State Library / District Library / City Library etc.

Between the two principles, that principle should be chosen which leads to a more helpful sequence.

v) Principle of Increasing Complexity

"If the subjects in an array of subjects or the isolates in an array of isolates show different degrees of complexity, they should be arranged parallel to the sequence of increasing complexity except when any other overwhelming consideration rules it out". (*Prolegomena,* p. 193). For example different categories of Geography are arranged on this principle : Mathematical Geography, Physical Geography, Biogeography, Anthropo Geography, etc. Similarly, we have the principle of decreasing complexity. Out of both one will be chosen which would provide a more helpful sequence.

vi) Principle of Canonical Sequence

"If the subjects in an array of subjects or the isolates in an array of isolates are traditionally referred to in a specific sequence, although no underlying principle is discoverable, it will be convenient to conform to this traditional sequence" *(Prolegomena,* p. 194)

The sequence of groups of primary basic subjects into the natural sciences group, the social sciences group and the humanities group is a traditional sequence. For example the division of mathematics into arithmetic, algebra, analysis, other methods, trigonometry, geometry, mechanics and astronomy. The division of forms of literature into poetry, drama, fiction and so on.

vii) Principle of Literary Warrant

The principle of literary warrant (*Prolegomena,* p. 196) directs that the subjects in an array of subjects or the isolates in an array of isolates may be arranged in the sequence of the decreasing quantity of the documents published or anticipated to be published on them, except when any other overwhelming consideration rules it out.

For example while arranging Food Plants CC follows the principle. Rice, Wheat, Oat, Rye, Corn, Barley, Millet, etc. In this arrangement Rice figures first because more literature has been published on it.

In a scheme prepared for a local library, the literary warrant would be interpreted in terms of the quantity of documents likely to be acquired by it. In an international scheme for classification, the above principle should be put into practice without any bias to the country where the scheme may have originated.

viii) Principle of Alphabetical Sequence

The principle of alphabetical sequence (*Prolegomena,* p. 197) directs that when no other sequence of the subjects in an array of subjects, or of the isolates in an array of isolates is more helpful, they may be arranged alphatetically, by their names current in international usage.

Self-Check Exercise-4

a) List out the Principles of helpful sequence.

b) On the basis of which Principles the isolates in Personality Facet of Religion are arranged?

c) On the basis of which Principles the Isolates in [P] Facet of Agriculture are arranged ?

d) Which Principle can be applied to arrange the works of Shekespeare.

e) Identify the main classes in CC which are subdivided and arranged on the basis of canonical sequence.

Note : i) Write your answers in the space given below.

ii) Compare your answer with the model answers given at the end of this Unit.

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6.4 STEPS IN REALISING THE CLASS NUMBER OF A DOCUMENT

The general theory of classification with postulates and principles enables us to do practical classification without any difficulty. Practical classification means translating the name of the specific subject embodied in documents into class number. The process of translation takes it from natural language into classificatory language, i.e. artificial language of ordinal numbers. Ranganathan formulated eight steps for realising the class number for a specific subject embodied in a document. These eight steps are :

Step-1 : *Raw Title :* The tile found on the title page of the document.

Step-2 : *Expressive title :* An expressive title is one expressing all the facets of a subject covered in the document.

Step-3 : *Kernal Title :* Title derived from the expressive title by removing all auxiliary terms and puffs and by replacing essential focal terms in their respective normative forms.

Step-4 : *Analysed title :* Title derived from the Kernal title by adding after each Kernal term the symbol denoting the nature of its manifestation.

Step-5 : *Transformed Title :* Title derived from analysed title by arranging the Kernal terms on the basis of the Postulates and Principles governing their sequence.

Step-6 : *Title in Standard Terms :* Title derived from transformed title by replacing each Kernal term with its standard term.

Step-7 : *Title in Focal Numbers :* Title derived from title in Standard Terms by replacing each Kernal term with its focal number.

Step-8 : *Class Number* : The Ordinal number derived from the Title in Focal Numbers by removing the descriptive symbols and inserting before each focal number its appropriate connecting symbol as prescribed by the postulates or the rules concerned.

In the following examples all the eight steps have been followed to arrive at the class number.

1. Raw title	:	Prevention of Tobaco Habit in the Rual Areas of Andhra Pradesh during 1980s.
2. Expressive title	:	Prevention of Tobacco Habit in the Rural Areas (in Sociology), in Andhra Pradesh during 1980s.
3. Kernal title	:	Prevention, Tobacco Habit in the Rural Areas, Sociology, Andhra Pradesh, 1980s.
4. Analysed title	:	Prevention [E], Tobacco Habit [E] Rural Areas [P], Sociology (BF), Andhra Pradesh [S], 1980s [T].
5. Transformed title	:	In this step the sequence of facets needs to be decided. In this title, we find Energy manifesting more than once as prevention [E] and tobacco habit [E], Personality is manifesting only once as Rural Areas [P]. Space and Time are each manifesting once in the form of Andhra Pradesh and 1980s, respectively. We know that 'prevention' cannot arise unless there is 'tobacco habit'. Therefore, the two manifestations of [E] should be arranged in the sequence of 'tobacco habit' and 'prevention'. As regards 'Rural areas' [P] it should come before [E], tobacco habit. As per the postulates for 'Space' and 'Time' Andhra Pradesh and 1980s come at the end. The resulting transformation is Tobacco habit [E], Prevention [E] Andhra Pradesh [S] and 1980s [T].
6. Title in Standard terms	:	Sociology (BC), Rural Group [P], Tobacco Habit [E] Prevention [E], Andhra Pradesh [S], 1980s [T].
7. Title in Focal Nos.	:	Y (BC), 31 [P], 412 [E], 5[2E], 4416[S], N8[T].
8. Class Number	:	Y31:412:5.4416'N8

6.5 SUMMING UP

In the preceding sections of this Unit you have been told about postulates and principles of facet sequence as enunciated by S.R. Ranganathan. The postulates and principles of facet sequence will help us in deciding the sequence of facets in a compound subject. Likewise the postulates and principles of helpful sequence will help us in deciding the sequence of isolates within a facet in a main class. The examples quoted at various sections of this Unit provided a clear idea as to the role and importance of principles of Facet and Helpful sequence. You have also been told about the eight steps involved in realising a class number of a given document. These eight steps are very helpful in arriving at the right class number. The principles of Facet sequence and Helpful sequence indirectly guide the classifier to arrive at the right class nubmer with the help of the eight steps.

6.6 MODEL ANSWERS

1) The postulates of Facet Sequence are :
   1) Postulate of First Facet
   2) Postulate of Concreteness

3) Postulate of Facet Sequence within a Round.

4) Postulate of Facet Sequence within the last Round.

5) Postulate of Level Cluster.

2) The Principles of Facet Sequence are :

1) Wall-Picture Principle

2) Whole-Organ Principle

3) Cow-Calf Principle

4) Actand-Action-Actor-Tool Principle

Titles :

a) Whole-Organ Principle

b) Wall-Picture Principle

c) Cow-Calf Principle

d) Actand-Action-Actor-Tool Principle.

3. Alien-Penumbral-Umbral-Penumbral-Alien (APUPA)

According to Dr. S.R. Ranganathan, the reader while looking for documents of his main interest (i.e. umbral region), he would also like to have formal look on either side of the umbral region for the subjects, which have a decreasing bearing on the umbral subject. The two regions on either side of the umbral region may be called his penumbral subjects. As the user examines the total region, his eyes will successively pass through alien, the penumbral, the umbral and again the penumbral and alien subjects. This arrangement, called APUPA arrangement, can be helpful in determining the most helpful sequences for the arrangement of subjects and documents.

4. (a) Ranganathan has given the following eight principles for helpful sequence.

These are :

1) Principle of Later-in-time.

2) Principle fo Later-in-evolution.

3) Principle of Spatial Contiguity

4) Principle fo Quantative measurement

5) Principle fo Increasing complexity

6) Principle of Canonical sequence

7) Principle of Literary warrant

8) Principle of Alphabetical sequence.

(b) The isolates in Personality Facet of Religion are arranged on the basis of Principle of Later-in-time.

(c) The isolates in Personality Facet of Agriculture are arranged on the basis of the Principle of Literary warrant.

(d) The works of Shakespeare can be arranged according to the Principle of Later-in-time.

(e) Mathematics, Physics, Geology, Fine Arts etc.

6.7 ASSIGNMENTS

1) Explain the Principles of Facet Sequence and show how they guide in deciding the sequence of facets in a compound subject, with examples.

2) What do you understand by Helpful Sequence ? Explain the principles of Helpful sequence and how they help in deciding the sequence of subjects.

3) What do you understand by 'Classification is translation' ? Apply the eight steps for classifying the following documents :

   a) Criticism of Gitanjali;

   b) Unskilled Labour in Textile Industry in Bombay in 1980.

   c) Treatment of Malaria

   d) Mango Yield in Uttar Pradesh during Summer 1985.

   e) Audio-Visual Method of teaching Library Science in the Universities in India in 1980s.

6.8 RECOMMENDED BOOKS

Ranganathan, S.R. *Prolegomena to Library Classification* 3rd ed. Bombay : Asia Publishing House, 1967 (Reprint by Bangalore : UBS Publishers, 1990). (Chapters RK to RP).

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Krishna Kumar. *Theory of Classification,* New Delhi : Vikas Publishing House, 1979. p 221-234.

Raju, A.A.N. *Decimal, Universal Decimal and Colon Classification : a study in comparison,* Delhi : Ajanta Publications, 1984. p. 112-114.

6.9 GLOSSARY

Facet Serquence : It is the sequence of different kinds of facets of a compound subject. For determining the facet sequence in a logical and helpful order Ranganathan enunciated certain postulates.

Helpful Sequence : A sequence easily understandable. Like things are put together while unlike things are separated. Helpful in various divisions of knowledge.

Class Number : 1. The combination of notational symbols, taken from the classification schedule, and used to denote particular class of a classification system. 2. Synonymous with classification number.

6.10 MODEL EXAMINATION QUESTIONS

I. ESSAY QUESTIONS

1) Explain the principles and postulates of Facet sequence with suitable examples.

2) What is helpful sequence ? Explain briefly the principles and postulates of helpful sequence with examples.

II. Short Notes

a) Transformed Title

b) Literary Warrant

UNIT-7 : PHASE RELATIONS

Contents

7.0 AIMS AND OBJECTIVES

In Unit 6, you have learnt about facets and their relation in subjects, methods of analysing and synthesizing them in a scheme of classification and also the process of classification. In this unit, you will be introduced to another kind of relation that is noticed in inter-disciplinary subjects, known as phase relation. Now, we will study why of phase relations, their types and kinds of relation and the practices of phase analysis and synthesis in different schemes of classification.

After studying this unit, you should be able to :

- explain the meaning of phase relation, and recognise different types and kinds of relations among subjects;
- become familiar with the principles and practice of phase analysis and synthesis;
- do classification of documents that display phase relations, using the techniques of phase analysis and synthesis.

7.1 INTRODUCTION

Knowledge is growing fast and becoming complex day by day. One of the notable features of the ever expanding universe of knowledge is the emergence of inter disciplinary subjects. This has been more evident for the last fifty years. These newly emerging subjects naturally call for newer techniques for classifying documents of such nature and organising them in a helpful sequence for storage and retrieval.

You have already studied different modes of formation of subjects (loose assemblage is one). The assembling of two or more subjects result in complex subjects, and the assembling of two or more isolates result in complex isolates. The problem of organising these complex subjects and complex isolates is met with phase rela

7.2 THE CONCEPT OF PHASE RELATIONS

The interaction of two normally distinct subjects is called 'Phase relation' and the analysis of a specific subject into phase is called 'Phase Analysis'. Phase is that part of a complex subject, which has been wholly derived from any one main class. Phase relation generally involves two-phased subjects or subjects with more than two phases. The complex subject with more than two phases is called 'Multiphased' or 'Poly-phased'. In other words, complex subject is a subject which contains foci from more than one main class. For example, the influence of computers on social development is a complex subject since it contains foci from *Sociology* and *Computer Science*. The part of such complex subject derived from a main class is called a phase. Here *Social development* is a phase; *Computers* is another phase. The interaction of these two phases is phase relation.

The constituent of a two phase subject, which is the primary subject of exposition, is called the Primary Phase or First Phase and the subject which is merely affecting the exposition of the first phase, is called its Second Phase or Secondary Phase. In the above example *'Sociology'* is the First Phase, since it is the primary subject of exposition. *Computer Science* is the secondary phase. According to Mills "Phase is that part of a complex subject derived from one distinct field of knowledge. The interaction of two normally distinct subjects is called Phase relation".

7.3 PHASE RELATIONS ACCORDING TO MILLS, PALMER & WELLS AND RANGANATHAN

There are various types of phase relations. According to Mills, there are three chief phases viz., Influence phase, Bias phase and Tool phase. Palmer and Wells enumerated five kinds of phases; Form phase, Bias phase, Influence phase, Comparison phase and Tool phase.

In Colon classification six kinds of Phase relations have been recognised. They are : General, Bias, Comparison, Difference, Tool and Influence. Each one of these relations occurs in three levels.

7.4 LEVELS OF PHASE RELATIONS

If the relationship is between two or more subjects, it is called inter-subject phase relation. When the relation is between two isolates within one and the same schedule of facet isolates, it is known as 'intra-facet phase relation', and when the relation is in between two isolates within one and the same array of isolates, it is known as 'intra-array phase relation'.

i) Inter-subject Phase Relation

In inter-subject phase relation, we notice relationships between two subjects. For example in *Sociology for economists,* sociology and economics are two different main classes. The specific subject of this title is sociology. The subject sociology is expounded to suit the special needs of economists.

ii) Intra-facet Phase Relation

In intra-facet phase relation, we see two isolate ideas of the same facet interact to form a complex subject. For example, in Comparative study of Buddhism and Jainism, the comparative study is between two religious faiths belonging to the facet religion.

iii) Intra-array Phase Relation

In intra-array phase relation isolate ideas belonging to the same array of facet are in relation with each other. Consider the following example : Comparison of rural and urban life. In this example the relation is between isolates rural and urban of the same array of the facet social groups in the subject sociology.

Self-Check Exercise-1

Identify the different types of Phase Relation by giving at least one example for each.

Note : i) Write your answers in the space given below.

ii) Compare your answer with the model answers given at the end of this Unit.

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7.5 KINDS OF PHASE RELATIONS

As was already studied earlier, in Colon classification there are six kinds of phase relation. Each and every relationship is represented by respective indicator digits. These symbols are used to introduce phases in a class number. The following table shows the indicator digits for each kind of phase relation at all the three levels.

Kind of phase relation	Inter subject relation	Intra Facet relation	Intra-array relation
General	a	j	t
Bias	b	k	u
Comparison	c	m	v
Difference	d	n	w
Tool	e	p	x
Influencing	g	r	y

The class number of a phased subject is got by inserting the respective indicator between two digit phases along with a connecting symbol (CS) 0 (Zero). In CC7, the indicator digit '0' was replaced by "&" (ampersand).

These are briefly explained in the following sections :

i) General Phase Relation

General phase relation denotes a more or less complete relation between two phases. In this one cannot depict the specific relation. Hence it is called 'General'. The sequence of phases hardly matters in general phase relation. But for the sake of consistency, the sequence of classes given in the classification schedule of any scheme of classification is followed for maintaining the sequence of phases.

General phase relation may be of any type of relation mentioned in Section 7.4, i.e. inter-subject, intra-facet or intra-array. This can be better understood by observing the following examples :

Inter-Subject : Relation between Political Science and Economics .. W0aY

Intra-Facet : Relation between Anatomy and Physiology ... L:20j3

Intra Array	:	Relation between Audio and Visual Methods of Learning in Education	.. T:4160t7

ii) /Bias Phase Relation

The Biasz Relation between two subjects indicates that the exposition of one subject (Phase 1) is biased towards another subject (Phase 2). The exposition is specially meant to meet the needs of a specialist in the subject. Hence, Phase 1 is known as Biased Phase and Phase 2 is known as Baising Phase. The sequence of these two phases is obviously the subject of exposition (Phase 1) followed by the specialist to whom the work has been written (Phase 2). Bias Phase relation may also be of any type of relations mentioned in Section 7.4 i.e. inter subject, intra-facet and intra-array. Let us observe the following examples :

Inter-Subject	Psychology for Physicians	.. S0bL
	Statistics for Librarians	.. B280b2

There appears to be no literary warrant to give examples of intra-facet and intra-array relations.

iii) Comparison Phase Relation

This Phase Relation denotes cases where two subjects are compared. It presents rather a different problem in relationship. Hence, both the phases (Phase I & II) are equal. Therefore, the one whose class number appearing first in the schedules of classification scheme is treated as the first phase. The second phase is called the "Comparison phase". Let us consider the following example :

Inter-Subject	:	Comparison between plants and animals (Inter-subject)	...	10cK
Intra-Facet	:	Comparison between morphology and physiology (Intra-facet)	...	1:20m3
Intra-Array	:	Comparative psychology of man and woman (Intra-array)	...	S:510v5

Iv) Difference Phase Relation

In this phase relation the difference between two subjects is expounded. Here also we have no indication of which is primary phase and which is secondary phase. The class number which has less ordinal value is considered first phase and the second phase is called the "Difference Phase". For, eg.

Inter-Subject	:	Difference between Religion and Ethics (Inter-subject)	...	Q0dR4
Intra-Facet	:	Psychological difference between adolescent and post-adolescent (intra-facet)	...	S20n3
Intra-Array	:	Difference between meditation and worship (Intra-array)	...	Q:4130w4

v) Tool Phase Relation

This phase relation deals with cases of documents where one subject is used as a tool to expound the other. This phase relation is a later addition to the list of relationships and is now recognised as one of the phase relations to classify documents which display such relations. This device, however, calls for further investigation to assess its full

implications. It is also called as "Exposition Phase". Let us observe the functioning of this phase with few examples :

Inter-Subject	:	Literature through art, a new approach to French Literature	...	O122&eN
Intra-Facet	:	Indian Music through painting	...	NR44&pNQ
Intra-Array	:	Carnatic music through Hindusthani Music	...	NR441&x5

(Note : Here CNs are worked out according to CC7)

vi) Influence Phase Relation

In this phase relation, the influence of one subject on another subject is expounded. The subject that is influenced is to be treated as the first phase and the subject which is influencing should be designated as the second phase. For example :

Inter-Subject	:	Influence of Geography on Politics	...	W0gU
Intra-Facet	:	Influence of intellectuals on ruling class	...	Y4170r53
Intra-Array	:	Influence of Income tax on Land Tax	...	X7230y4

Note : The sequence of the two phases in these examples are :

Politics - Geography.

Ruling classes - Intellectuals

Land tax - Income tax

So far, six kinds of phase relations have been identified. It is quite possible that a few more may be encountered. The noteworthy point is that a method has already been provided, as in Colon Classification, which may be helpful in handling complex subjects of the future.

Such elaborate devices exist only in CC. UDC and DDC have not made provision to distinguish different types of relations.

Foreign relations between India and UK 327.54041

In this case India (54) and UK (41) are from the same facet and hence can be stated as intra-facet relation. (0 is the connecting digit).

Self-Check Exercise-2

Identify the kinds of pahse relationship in each of the following titles. And also arrange the phases according to the sequence in Colon Classification.

i) Mathematics for Engineers

ii) Influence of Politics on Education

iii) Difference between Advaita and Vishishtadvita philosophy

iv) Comparison between Fiat and Maruti Cars

v) Application of Music for plant growth

Note : i) Write your answers in the space given below.

ii) Compare your answer with the model answers given at the end of this Unit.

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7.6 PHASE RELATIONS IN OTHER CLASSIFICATION SCHEMES

Colon classification is the only scheme to set out detailed provisions for phase relationships. The phase relation in other schemes of classification are not direct. However, they are implied.

7.6.1 Phase Relation in DDC

Dewey Decimal Classification, being an enumerative system of classification, has very limited provisions for the explicit use of phase analysis and synthesis. Its recognition of complex subjects, however, can be noted in the provision given for classifying such subjects. These provisions are :

i) Enumeration of complex subjects in its schedules :

Example : Relation (Influence) of Science and Religion at 261.55

ii) Use of Standard Subdivisions for Bias Relation :

Standard Subdivision - 024 Works for specific types of user makes this provision.

Examples :

Mathematics for Engineers 510.02462

510 Mathematics

024 Works for Specific Users (Table-1)

62 Persons occupied with engineering and allied operations and manufacturing (Table-7)

iii) Rules given at some places in the schedule for phase analysis and synthesis :

Example : Foreign relations between India and China 327.54051

327 Foreign relations

54 India (From Areas Table)

0 Connecting digit

51 China (From Areas Table)

Note : i) This is an example that can be regarded as a case of intrafacet relationship

ii) It must be noted that these provisions in DDC are not adequate for classifying complex subjects.

7.6.2 Phase Relations in Universal Decimal Classification

In Universal Decimal Classificaiton, the Relation Sign Colon (:) is used to indicate all types and kinds of phase relations. The same sign is also used for facet relations. The following examples illustrate these statements.

2:5	Religion and Science (Inter-Subject - General Phase relation)
51:62	Mathematics for Engineers (Inter - Subject Bias Phase relation)
22/28:294.3	Comparison between Christianity and Buddhism (Intra-facet-Comparison Phase relation)
595.141:591.142	Difference between simple marine worms and earth worms (Intra-array-Difference Phase relation)
7:8	Influence of literature on art (Inter subject - Influence Phase relation)
8:7	Literature through art : a new approach (Inter subject - Tool Phase relation)

Examples of Colon (:) for Facet relation.

635.915:632.38	Virus diseases of indoor plants
669.14:621.791	Welding on steel
371.212:373.5	Admission to Grammar Schools
624.21:625.1	Railway Bridges

The sequence of phases are reversible as in the case of facet relations. This is in accordance with the principle of flexibility in UDC.

As in CC one cannot distinguish the type of relation as only one connecting symbol is used for all types of relations.

7.7 SUMMING UP

From the above paragraphs you have been introduced to distinguish the relations between two subjects, which is called phase relations. For the purpose of helpful arrangement of subjects it is necessary to distinguish the relationship. In these complex subjects the first subject is the primary phase and the second one is secondary. The three types (inter-subject, intra-facet and intra-array) and six kinds (general, bias, comparison, difference, tool and influence) of phase relations have been explained with examples.

All classification schemes use phase relations in one way or the other. However, they are not clear and distinct. Colon classification is the only scheme with which every type of inter disciplinary subject can be classified coextensively. It increases versatality to the notational system and provides autonomy to classifier. In UDC we cannot distinguish between the different types of relations because of its single connecting symbol (:) for all relations. DDC has yet to make provision for these types of relations.

7.8 MODEL ANSWERS

1. The Phase relations are of three types. They are :

Inter Subject	:	Religion for School Children
Intra Facet	:	Comparison of the Cultivation of Rice Crop with Sugar Cane Crop.
Intra Array	:	Difference between rice and wheat crops.

2. i) Bias : Relation between two basic classes: Mathematics and Engineering - the subject is Mathematics.

   ii) Influence : between two basic classes : Politics is influencing phase - Education is the first subject.

iii) Difference	:	intra-facet relation, in the same basic class of Religion
iv) Comparison	:	intra-array relation
v) Tool	:	between two basic classes. Music is a tool and the first subject is plant growth.

7.9 ASSIGNMENTS

1) What is the difference between a facet and a phase ?

2) How phase relation in CC help in the construction of class number for a complex subject?

3) What are the different kinds of phase relations and how they are expounded ?

4) How the phase relations are employed in DDC and UDC ? Cite a few examples.

7.10 RECOMMENDED BOOKS

Kaula, P.N. *A treatise on Colon Classification.* New Delhi: Sterling, 1985. p. 62-71.

Krishan Kumar. *Theory of Classification.* New Delhi: Vikas Publishing House, 1983. p. 328-339.

Raju, A.A.N. *Decimal. Universal Decimal and Colon Classificaiton : A study in comparison.* Delhi : Ajanta Publications, 1984. p. 201-208.

Ranganathan, S.R. *Colon Classification.* 7th ed. Bangalore : Sarada Ranganadhan Endownment for Library Science, 1981.

Ranganathan, S.R. *Elements of Library Classification.* 3rd ed. Bombay : Asia Publishing House, 1962 (reprint by Bangalore : UBS Publishers, 1990), p. 90-94.

7.11 GLOSSARY

Array	:	The first divisions obtained on the basis of the application of a chracteristic of a class. Example : Toys (division by material used) Mud, Wood, Metal, Paper, Plastic.
Facet	:	A group of isolates, obtained on the basis of the application of one or more characteristics of a class. (In the above example, the group of isolates and their further divisions constitute a facet of the class Toys).
Intra	:	Within (Within a facet or within an array).
Literary Warrant	:	Justification for the various provisions of a library classification system based not on theory but on the existence of actual works.

7.12 MODEL EXAMINATION QUESTIONS

I. ESSAY QUESTIONS

1) What is phase Relation ? Explain the concept of phase relation expounded by Mills, Palmer & Wells.

2) Explain the levels and kinds of phase relations used by S.R Ranganathan

II. SHORT NOTES

a) Phase relations in DDC

b) Phase relations in UDC.

UNIT-8 : COMMON ISOLATES

Contents

8.0 AIMS AND OBJECTIVES

An isolate is, as we have already studied in the previous Unit, an idea complex fit to form a component of a subject, but not by itself fit to be deemed to be a subject. The isolates are of two kinds - Common Isolates and Special Isolates. Common isolates are common to all main classes. Special isolates are those isolates which are special to a basic class or to a small group of basic classes, but not to all the basic classes in a scheme of classification. This Unit deals with the concept of Common Isolates.

After going through this Unit you will be able to :

- explain Common isolates and how they are different from Special Isolates;
- identify their types and kinds of Common Isolates; and
- know their application in CC, DDC and UDC.

8.1 INTRODUCTION

While classifying documents one comes across certain features common to all subjects. In a scheme of classification such common features are listed once and are not repeated in each and every subject schedule. Listing of them at one place of the schedules and using the same again and again as and when necessary results in the economy of size and printing. All such features are known as Common Isolates (CI).

Common Isolates are not divisions of knowledge. But, they can form components of several compound subjects. These isolates are truly omni present. For Eg. : we find Dictionary, Periodical, Encyclopedia - are all kinds of bibliographical forms; Statistics, Law, Research, History, Geographical point of view - are all common terms applicable to most of the classes in

a scheme of classification. Observe the following examples :

Dictionary of Biology

A *Bibliography* of Colon Classification

Journal of Chemistry

Directory of Public Libraries.

Here, dictionary, bibliography, journal, directory, etc. are not subject divisions. They are common isolates. These CIs are known by different names in different schemes of classification. In DDC they are known as common sub-divisions, form-divisions, and standard sub-divisions. In UDC they are called common auxiliaries. Ranganathan used the term Common Isolates in his Colon classification.

8.2 HISTORY OF COMMON ISOLATES

There are several things which go to the credit of Melvil Dewey. The concept of common isolates is one of them. In the beginning he called them form divisions. They were first introduced in the second edition of DDC brought out in 1885. Since then they have undergone several changes. The name form divisions continued upto the twelth edition of DDC published in 1922. This name was changed to common subdivisions in the thirteenth edition appeared in 1932. These common subdivisions were listed under three different categories, viz. miscellaneous common subdivisions, view-points and form divisions. This whole set reappeared as just form divisions in the fifteenth and sixteenth editions and was renamed as standard subdivisions in the seventeenth edition. The seventeenth edition also identified space and time isolates as common isolates and listed them as such. Until the publication of the seventeenth edition, the history schedule had been used for space isolates.

In UDC, common isolates are called auxiliary sub-divisions, Broadly, there are two types of auxiliaries in use in UDC : Common and Special. Auxiliaries of form in UDC are like the standard subdivisions of DDC. Space and time isolates are treated as common auxiliaries and listed separately. The use of auxiliaries in UDC is an important aspect in number building.

In the first edition of CC, there were three different schedules for common subdivisions of which space and time were two. The number of common subdivisions was small initially. It was only in the fourth edition of CC that these were recognised as anteriorising and posteriorising common subdivisions. In the first edition, they were named as common isolates. After several changes through successive editions an exhaustive list of common isolates has emerged in the seventh edition of CC.

8.3 NEED FOR COMMON ISOLATES

Ranganathan defined common isolates as "an isolate idea denoted by the same isolated term and represented by the same isolate number". In DDC, it has been explained as "a special kind of patterned repetition". Any subject can be presented in several forms. It could be in the form of outline, history, theory, or dictionary. It could also be in the form of a periodical or handbook. It could as well be a presentation of how to study or teach that subject. These common forms and modes of presentation are called standard subdivisions.

It has been found that certain kinds of concepts keep recurring and may be found in many subjects, e.g. procedings, periodical, dictionary or encyclopedia. These are all referred to as forms of presentation. Publications like Journal of Economics, Encyclopedia of Philosophy and Preceedings of All India Library Conference have their own subjects. All these subjects, however, are presented in a particular form. The forms involved here such as journal, encyclopedia and conference proceedings are commonly referred to as outer forms. There are

inneer forms also, i.e. forms of approach to the subject. For example, theory, study and teaching, history and biography are various approaches to the subject and they are known as inner forms.

We also find that subjects are treated in the historical and geographical contexts which are usually called by the terms time and space respectively. Thus, inner and outer forms of presentation and historical and geographical treatment are features common to all or most subjects. They, therefore, recur throughout the scheme of classification. In library classification, such recurring concepts are standardised. This standardisation results in economy of size, as it restricts the length of the schedules in a scheme by listing these common features only once. incidentally, standardisation also lends mnemonic values to the recurring concepts, as they are consistently expressed by the same set of symbols. Hence, in a scheme of classification, separate tables are provided for common isolates and directions are given for their application.

Self-Check Exercise-1

Who has first introduced the concept of common isolates and when ? How are they used ?

Note : i) Write your answers in the space given below.

ii) Compare your answers with the Model answers given at the end of this Unit.

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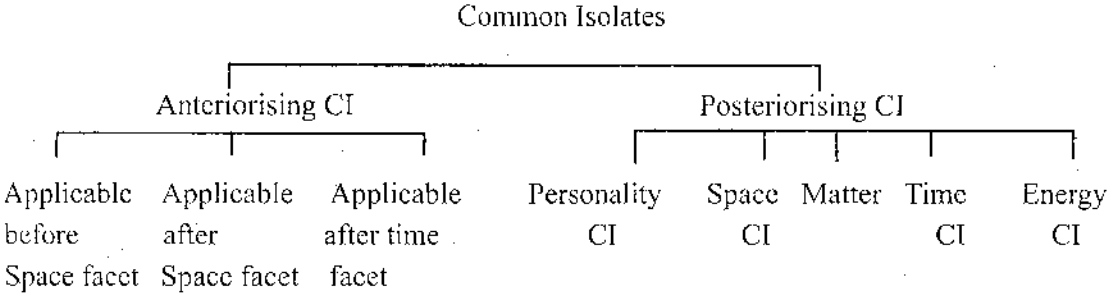
8.4 COMMON ISOLATES IN CC

The common isolates in CC are quite different from those of DDC and UDC. Though the purpose and need for common isolates are the same, the number of common isolates and their application differ in CC. It has clearly differentiated the common isolates from the special isolates. Common isolates are defined in CC as those which denote the same isolated term and are represented by the same isolate number. The family of common isolates in CC is also very large. There are several types of common isolates which can be seen at a glance from the following diagram :



A clear distinction has been made between anteriorising and posteriorising common isolates. Anteriorising common isolates are attached to a host (class) number without any connecting symbol, whereas posteriorising common isolates are attached with a connecting symbol.

8.4.1 Anteriorising Common Isolates (ACI)

ACI are those isolates attached to the class numbers of the documents, which require to be arranged anterior to the ordinary documents of the same subject. These documents are called approach material. They are looked up for specific information or as a help before entering into the region of the general books on the subject of a concern. In other words, these approach materials are usually needed for preliminary perusal before the use of regular books required for continuous study. These isolates when attached to a host class makes the resulting class to have precedence in arrangement over the host class. The Canon of Helpful Sequence suggests anteriorising position to approach materials. That is to say that approach material like bibliographies, dictionaries, encyclopedias etc. will be placed before the documents on that class.

ACI are represented by lower case letters. Each lower case letter is invested with 'Anteriorising value'. They do not require a connecting symbol for their attachment to a host class number. Therefore the class numbers with ACI shall have a precedence over the host class number. For example -

Ea Bibliography of chemistry, precedes over

E Chemistry

(Here 'a', an ACI, stands for Bibliography.)

The ACI is of three kinds :

1. ACI applicable before Space facet.
2. ACI applicable only after Space facet.
3. ACI applicable only after Time facet.

i) ACI applicable before Space Facet

The ACI can be applied anywhere after the basic class, but not after Space and Time facets. The following is a select list of ACI under this category used in CC6 :

Isolate Number	Isolate term	Facet Formula
a	Bibliography	a[T]
f	Atlas	f[T]
k	Cyclopaedia	k[P],[P]2
m	Periodical	m[P],[P2]
n	Serial	n[P],[P2]
p	Conference Proceedings	p[P],[P2]
v	History	v[S],[T]
w	Biography	
	General	w[S],[T]
	Individual	w[P]
	Autobiography	w[P],1
	Ana	w[P],2
	Letters	w[P],4
x	Works (Collection or Selection)	
	General	x[S],[T]
	Individual	x[P]

Examples	
J382aN7	A Bibliography on Wheat (documents published upto 1970s)
Ck	Dictionary of Physics
k56,L	Encyclopaedia Britannica (which was started in Great Britain in 1768)
Em44,N63	Indian Journal of Chemistry (started in 1963)
Ap44,N75	Proceedings of Indian Science Congress held at Waltair, 1975.
Bv44,N8	History of Mathematics in India brought upto 1980s.
CwM88 Physics)	Biography of Sir C.V. Raman (Born in 1888 and associated with
CwM88, 1	Autobiography of Sir C.V. Raman
V44,21y7M89	Biography of Jawaharlal Nehru (born in 1889)
V44,21yM89, 1	Autobiography of Jawharlal Nehru
V44,21y7M89,4	Letters of Pandit Nehru
△ 2y7M72	Shri Aurobindo : a biography

In case of biography of a person, which goes with the main classes Spiritual Experience and Mysticism and History, the Common Isolate wBiography should be replaced by y7 case study. This rule clearly reflects in the above last four examples.

ii) ACI applicable only after Space Facet

These ACI are applicable only after Space facet and nowhere else. The following is a list of ACI under this category used in CC6 (Page 2.6)

Isolate Number	Isolate Term	Facet Formula
r	Administration report	
s	Statistics (if periodical)	s[T]

Examples	
22.4416r	Report on Public Libraries in Andhra Pradesh
Y:5.44sN81	Population of India: 1981 Census.

iii) ACI applicable only after Time Facet

These ACIs are applicable only after Time Facet and nowhere else. The following is a list of ACI under this category used in CC6 (Page No. 2.6)

Isolate Number	Isolate Term
s	Statistics (if stray)
t	Commission report
t4	Survey
t5	Plan
t6	Ideal

v	Source Material
v5	Literature
v6	Tradition
v7	Archaeology etc. (as in V History)
v8	Archive (as in V History)

Examples

T.44'N66t	Report of the Education Commission India 1966.
T4.44'N73 ←N69t5	Higher Education in India : Fourth Five Year Plan (1969-73)

8.4.2 Posteriorising Common Isolates (PCI)

PCI are used for the documents which do not require anterior position among the other documents bearing the same host class number. PCI are to be preceded by connecting symbols while attaching to the host class. Hence, they are filed after the documents on the class to which they are attached. Another reason is that the PCI narrow down the extension of the class they qualify and so file after the single class number.

The PCI are of two kinds :

1. Energy PCI, and 2. Personality PCI

i) Posteriorising Common Isolates : Energy Common Isolates :

The energy (PCI) are to be preceded by a colon (:) when attached to a host class. A list of PCI under this category used in CC6 are as under :

Isolate Number	Isolate Term
b1	Calculating
b2	Designing
b6	Measuring
e1	Weighing
f	Investigation
f2	Observation
f3	Experiment
f4	Discussion
g	Criticism
p	Drafting
r	Reporting
u	Surveying

Examples

O111,2J64,51:g	Criticism of Hamlet
E:f3	Experiments in Chemistry

ii) Personality (PCI)

The following is a list of Personality (PCI) used in CC6 :

Isolate Number	Isolate term
b	Profession
d	Institution
e	Education
e2	Lower
e4	Higher
f	Inverstigating
f2	Observational
f3	Experimenting
f4	Discussional
f7	Yogic (Asrama)
g	Learned Society
h	Industrial body
k	Commercial body
w	Administrative Department of Government

A Personality Common Isolate should generally be added after Space. These are to be preceded by ',' (Comma) when attached to a host class.

The Fecet Formula as applicable for most of the Personality (PCI) is as follows:

(CI), [P], [P2], [E]

[P] The isolate in the [P] is to be got by (AD) if a localised body; or by (CD) if a non-localised body. The (CD) number should be preceded by 9 and the [P] should be preceded by a comma.

[P2] PCI may be fitted when warranted, with [P2]: [E] as in the main class V History.

Examples

D.44,c4,R,12:3'N5	Funtions of the Vice-Chancellor of Roorkee Engineering University in the 1950s.
Here	
(CI) is e4	Higher Education Institution
[P] is R	Roorkee by (AD)
[P2] is 12	Vice-Chancellor (Same as Governor [P2] of V History)
[E] is 3	Function [E] from V History Class
[T] is N5	Stands for 1950s
2.44,g,9N33v	History of Indian Library Association (founded in 1933)
Here (PCI) is g	Learned Society (ILA)

[P] is N33 ILA was founded in 1933 (digit 9 is added according to the Rules)

(CI) is v History

Self-Chek Exercise-2

What type of Cls does CC provide ? Identify the Cls in the following Class Numbers.

a) V44,21y7N17

b) L45:4725ff

c) Wm44,N31

Note : i) Write your answers in the space given below.

ii) Compare your answers with the Model answers given at the end of this Unit.

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8.4.3 Common Isolates in CC7

CC7 has provided elaborate and extended schedules of Common Isolates. CC7 has alloted "(double-inverted comma) as new indicator digit for ACI. It has increased the expressiveness of the class number and the hospitality in the array in the notational plane.

The following types of Common Isolates are found in CC7:

Anteriorising Common Isolates

Common Personality Isolates

Common Matter Isolates

Common Energy Isolates

Space Isolates; and

Time Isolates.

8.5 COMMON ISOLATES IN OTHER SCHEMES OF CLASSIFICATION

Different classification schemes use common isolates with different names. In DDC they are called standard subdivisions and UDC names them as common Auxiliaries.

8.5.1 Common Isolates in DDC

In DDC, common isolates have undergone several changes in both nomenclature and presentation. They were designated by different names in different editions of DDC. The different names used so far are form divisions, common subdivisions, view point numbers and standard subdivisions. From the seventeenth edition onwards they have been called as Standard Subdivisions. A complete list of standard subdivisions appears as Table 1 in Volume 1 of the nineteenth edition of DDC.

Standard Subdivisions in DDC :

-01	Philosophy and Theory
-016	Indexes
-02	Miscellany
-022	Illustrations and Models
-028	Techniques, Procedures, Apparatus, Equipment, Material
-0285	Data Processing
-0288	Maintenance and repair
-03	Dictionaries, Encyclopedias, Concordances
-05	Serial Publications
-06	Organisations and Management
-07	Study and Teaching
-072	Research
-08	History and description of the subject among group of persons.
-09	Historical and Geographical Treatment.

A note along with Table 1 states that "the notations are never used along but may be used as required with any number from the schedules". It is, thus, clear that the above numbers are not used independent of the core numbers from the subject schedules. Every number in the above table is preceded by a dash which merely shows that the number never stands alone. The dash is to be omitted when it is added to a core number taken from a subject schedule.

Space and Time Isolates in DDC

Upto the sixteenth edition of DDC there was no separate table for space isolates. Whenever required, they were taken from the history schedule. They were separately listed for the first time in the seventeenth edition and later greatly improved in the nineteenth edition. They are known as Area numbers and given in Table 2 of Volume 1. Some class numbers are incomplete without the addition of area numbers especially where the subject treatment is on a geographical basis. Take, for example, subjects like *Foreign policy of India, Economic conditions of China and Political parties of the United Kingdom*. In all these cases, the elements of geographical area (space) is so important that without it the class number is incomplete and incomprehensible. Hence, all schemes of classification have made provision for space isolates.

In DDC, the greater part of volume I is devoted to area numbers. Broadly, the division of geographical space is represented as under :

-1	Area, regions, places in general
-2	Persons regardless of area, region and place
-3	The ancient world
-4	Europe
-5	Asia
-6	Africa
-7	North America
-8	South America
-9	Other parts of the world

Having seen the space isolates in DDC, let us now examine the Time isolates in it. Provision of time isolates is not as extensive in DDC as it is in UDC and CC. The time isolates in DDC are in the form of historical periods and given in Table 1 as part of the standard subdivisions. Their use is limited. The treatment of time in subject schedules is on the basis of a few very broad historical periods as under :

-0901	-	to 499 AD
-0902	-	500 - 1499
-0903	-	Modern period, 1500-
-0904	-	20th Century, 1900-1999
-0905	-	21st Century, 2000-2099

The details of subdivision of time isolate is given on pages 10 and 11 of volume 1 of the nineteenth edition of DDC.

Application of Common Isolates in DDC

A given document is first analysed to find the subject and then assigned an appropriate subject number. It is further examined if an additional number from the standard subdivisions table is called for. If the book you are classifying is, say, the teaching of geography, it is to be first given the number for geography. To this Number is added the standard subdivision notation for teaching from Table 1. You already know that a standard subdivision is added to a base core number. In our example, the number will be 910.7 where 91 is geography and 07 is study and teaching from Table 1. Some other examples are :

Medical dictionary	610.3	(61 plus 03)
Encyclopedia of religion	203	(2 plus 03)
Journal of agriculture	630.5	(63 plus 05)
Research in crystallography	548.072	(548 plus 072)

All the notations added with zero in the above examples are standard subdivisions. They are applied with a Zero. However, there are instance where initially a zero has been used for the division of the core subject, and in such cases, instructions are given in the schedules whether one has to use two more zeros.

Note a few examples worked out below :

Encyclopedia of oriental philosophy	181.003
Dictionary of political science	320.03
Journal of social welfare	361.005
Journal of engineering	620.005
Journal of public administration	350.0005

Mark the contrast between the numbers in these examples and those in the earlier examples. The standard subdivisions are connected with the core numbers with two, three or even four zeros. Such use is stated in the schedules and hence there is no difficulty encountered while classifying. The only precaution you have to take before applying the standard subdivision numbers from Table-1 is to check in the subject schedule whether one or more zeros are required to be added.

A common isolate for space also can be added to a class number taken from the relevant schedule. Here again, before applying a space isolate it is to be checked in the relevant schedule if provisions for applying the space element already exists there. If yes, the number is built as stated in the scheme. It is only when there is no provision in the schedule and without the application of a space isolate the class number would be incomplete, you can apply the space

isolate from the standard subdivisions. Take, for example, Income tax in India. Here, no provision has been made in the schedule for area numbers. In all such cases we can construct the full number, taking the space isolate for India along with - 09 standard subdivision.

336.24	Income tax
09	Historical and geographical treatment as given under standard subdivisions (Table-1). Under 09, there is a direction to add country number from Table 2.
54	India.
336.240954	Income tax in India.

Self-Check Exercise-3

Why two or more zeros are added in certain cases while applying s.s. in DDC ?

Note : i) Write your answers in the space given below.

ii) Compare your answers with the Model answers given at the end of this Unit.

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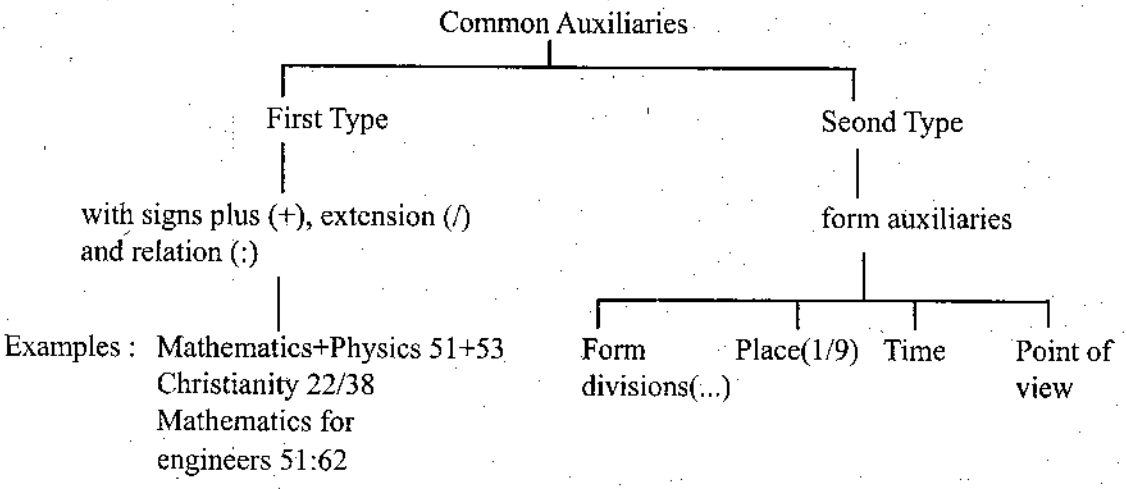
8.5.2 Common Isolates in UDC

In UDC, common isolates are known as auxiliaries. They fall into two categories : general and special. The general category prevades the whole scheme, whereas the special category is relevant to only specific parts of the scheme. Again, the general category can be divided into two groups :

i) those that are signs to join other notational elements, and

ii) those that introduce explicit tables of subdivision.



The common auxiliaries of form in UDC are like the standard subdivisions in DDC and the anteriorising common isolates in CC. Place and time in UDC are exactly as in CC. The points of view in UDC resemble the posteriorising common isolates of CC.

Connecting Symbols for Common Isolates in UDC

The connecting symbols or indicator digits in UDC play a major role in building the class numbers. As in CC, the indicator digits in UDC reveal the type of facet used. That is the reason why in depth classification, UDC has become very popular throughout the world.

The common auxiliaries of form are put in parentheses with a connecting symbol nought (0.....). They are used more for outer forms of presentation like dictionary, journal, etc. They are also used for a few inner forms.

A space isolate in UDC is like an area number in DDC. In UDC, it is put in parentheses (1/9). As in CC, it contains a part from the political division and there is also provision for zones, orientation, physical features, etc.

A time isolate in UDC compares well with CC. There is provision to show months, days, hours and even minutes. The time isolate is encased in double inverted commas (".....").

Application of Common Isolates in UDC

Following are a few illustrative examples of the use of common isolates in UDC. We will see the common auxiliaries of form, place and time.

Common auxiliaries of form : In the following examples, you will find the use of both inner (e.g. history) and outer (e.g. journal) forms.

Treatise on international law	341 (021)
Dictionary of international law	341(03)
Journal of international law	341(05)
Teaching of International law	341(07)
History of international law	341(09)

The common auxiliaries of form in the above examples are put in parentheses with a zero as the connecting symbol.

Common auxiliaries of Place : Like DDC and CC, UDC also provides a fairly exhaustive schedule of geographical isolates. This schedule covers political as well as physiographical divisions. All these are called common auxiliaries of place. Their application is simple and easily understandable. A few examples are given below for your benefit. You will notice that the place number is always put in parentheses without any prefix.

327(540) - Foreign policy of India

where 327 is foreign policy, and (540) is India.

Bilaterial relations between two countries can also be shown with ease. Thus,

327(540:41). Bilateral relations between India and the U.K.

The number for the second country (41 U.K. in the above case is joined with a colon).

33(540-202) - Economic conditions of rural India

where 33 is Economics

(540) is India

(-202) is Rural zone (Zones or defined areas can be joined by a hyphen to another place).

Common auxiliaries of Time : The time isolates in UDC are applied wherever needed. These are almost similar to those in CC. The connecting symbol for the time element in UDC is two double inverted commas ("...".) Even months, weeks, days, hours or minutes, as stated earlier, can be represented. The minus sign (-) in the time isolate indicates period before Christ. A few examples illustrating the use of time isolates are given below :

1988	"1988"
15th August 1947	"1947.08.15"

6th November 1987	"1987.11.06"
32 B.C.	"-0032"
6th Century	"05"
19th Century	"18"
1950s (1950-1959)	"195"
18th to 20th Centuries	"17/19"

Applying a time number is also very simple. For example : Economic conditions in India in the 19th Century : 33(540)"18" (33 Economics (540) India and "18" 19th Century).

Self-Check Exercise-4

How will you distinguish between common auxiliaries of place from common auxiliaries of form in UDC ?

Note : i) Write your answers in the space given below.

ii) Compare your answers with the Model answers given at the end of this Unit.

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8.6 SUMMING UP

The need for common isolates is recognised by all schemes of classification. Library of Congress Classification is the only exception. The reason is that each subject schedule has been independently developed, unintentionally eliminating the need for common isolates. Melvil Dewey was the first to realise the need for such features in classification. It is common knowledge that in a scheme of classification, several concepts often recur in all or most subjects, and instead of enumerating them under each subject, it is convenient to codify and enumerate them once in a scheme. They can then be applied according to the rules stated in the scheme of classification.

In DDC, they are now called standard subdivisions and listed in Table 1 of its volume I. In CC, there are several types of common isolates and the list is also very exhaustive. The mode of their application is also different compared to DDC. Colon Classification is the only scheme which provides anteriorising common isolates. In UDC, they are known as auxiliaries. The list of auxiliaries is fairly exhaustive. Some of these are just signs.

8.7 MODEL ANSWERS

1) Melvil Dewey was the first to introduce the concept of Common Isolates in library classification. They were introduced by him for the first time in the second edition of Dewey Decimal classification in 1885. These appeared as form divisions upto the 12th edition. The 13th edition was brought out in 1932 and Dewey designated them as common subdivisions of three different categories, viz., miscellaneous common subdivisions, view-points and form divisions. Thus, the concept was fully developed.

2) Common Isolates in CC can be broadly categorised under two headings : anteriorising (ACI) and posteriorising common isolates (PCI). The ACI when attached to a host class,

get precedence in arrangement over that class. Personality, matter and energy common isolates comprise the posteriorising category of common isolates. Space and time isolates are also treated as common isolates.

a) V - History
   44 - India
   21 - Prime Minister
   y7 - Case Study (used for biography in the main class History)
   N17 - 1917

b) L - Medicine
   45 - Lung
   4725 - Malignant tumorous (Cancer)
   f - Investigation

c) W - Political Science
   m - Periodical (Anteriorising Common isolate)
   44 - Originated in India
   N31 - Started in 1931

Thus meaning Indian Political Science Journal started in 1931.

3) A standard subdivision is generally added to the host-class with a single zero. In a few cases, however, a zero has already been used in the schedule to divide a given subject and in such cases an additional zero has to be added while applying a standard subdivision. Sometimes more than one zero has also been used in the schedules to divide the relevant subject. In all such cases, instructions are provided at appropriate places on the number of zeroes to be added.

4) Both the common auxiliaries of place and common auxiliaries of form are put in parentheses in UDC. There is a clear distinction between these two. The common auxiliaries of place are added in the parentheses where as common auxiliaries of form are preceded by a zero within the parentheses.

8.8 ASSIGNMENTS

1. What is a Common Isolate ? What are its purposes ?
2. Discuss the treatment of C1 in CC.
3. Compare the auxiliary tables of CC, DDC and UDC.

8.9 RECOMMENDED BOOKS

Dewey Decimal Classification and Relative Index. 19th ed. 3v. Albany, NY: Forest Press, 1979.

Kaula, PN. *A treatise on Colon Classificaiton.* New Delhi: Sterling, 1985. p. 113-120.

Krishan Kumar. *Theory of Classification.* New Delhi: Vikas Publishing House, 1983. p. 259-375

Raju, A.A.N. *Decimal, Universal Decimal and Colon Classification : a study in comparison.* Delhi : Ajanta Publications, 1984. p. 161-167.

Ranganathan, S.R. *Colon Classification.* 6th ed. Bombay : Asia Publishing House, 1963.

Ranganathan, S.R. *Colon Classification.* 7th ed. Bangalore : Sarada Ranganadhan Endowment for Library Science, 1981.

Ranganathan, S.R. *Colon Classification.* 6th ed. Bombay : Asia Publishing House, 1960. p. 1. 43-1. 48.

Sachdeva, M.S. *Colon Classification : Theory and Practice.* 2nd ed. New Delhi : Sterling 1980. p. 180-186.

UDC International Medium Edition-English Text (BSI 1000 M : 1985) London : BSI, 1985. Introduction (Part-I)

8.10 GLOSSARY

Anteriorising Common Isolate : A common isolate having precedence in arrangement over the host class to which it is attached.

Basic Class : A main class in a scheme of classification and enumerated as such.

Mnemonics : The meaning of the work is to assist memory. In a scheme of classification a digit or a group of digits is used to represent a specific concept in all class numbers having the same concept. This leads to uniform representation of a concept.

Nomenclature : A set or system of names in a subject.

Posteriorising Common Isolates : Opposite of anteriorising, coming after in order.

8.11 MODEL EXAMINATION QUESTIONS

I. ESSAY QUESTIONS

1) What are Common Isolates ? Explain different types Common Isolates used in Colon Classification with examples.

2) Discuss the application of Common Isolates in DDC and UDC.

II. SHORT NOTES

a) Common Isolates in CC7

b) Connecting Symbols for CI

UNIT-9 : CANONS FOR CLASSIFICATION

Contents

9.0 AIMS AND OBJECTIVES

The theory of library classification is enriched by the sound foundations laid on scientific principles prominently by S.R. Ranganathan. His Canons of classification form such a strong foundation on which the classification theory stands firm.

After studying this unit, you should be able to

- define the terms 'Laws', 'Canons', 'Principles and Postulates' as used by Ranganathan;
- explain the canons for classification as enunciated by Ranganatham and
- interpret and use various canons for library classification.

9.1 INTRODUCTION

'Canon' is a word used to mean a law of the church or a rule. In the context of classification theory a canon of classification would mean a rule for classification. Canons for classification, therefore would mean rules for classification. When the library science was in its early stages of development it was mainly considered to be an art and not a science at all. Classification of books was considered to be a kind of arrangement which could help the librarian in keeping the books on the shelves.

In Unit 2 at Section 2.5.2 you have seen how books were arranged in different ways in the olden days and in Section 2.5.3 the problems of such an unscientific arrangement were discussed.

If classifications were to be more systematic and scientific there should be some principles or rules which would govern the arrangement. E.C. Richardson attempted to develop a few canons early in the 20th century. Later, W.C. Berwick Sayers put forward some canons for classification. He gave the name 'canons' for these rules. Subsequently, other thinkers on classification theory also attempted to develop such rules. E.C. Richardson used the word "Criteria". H.E. Bliss enunciated "Principles" of classification while Ranganathan retained the term "Canons" used by Sayers.

Whatever be the name - 'Criteria', 'Principles' or 'Canons' - certain rules are needed for laying the foundation for a sound theory of classification. In Unit 3 of this course you have come to know some of the principles that the great classificationists like Brown, Richardson, Hulme, Sayers, Bliss and Ranganathan have formulated. And in the same unit you have also read in brief about some canons of classification. In this unit you will get to know the canons for classification enunciated by Ranganathan.

9.2 NORMATIVE PRINCIPLES

Normative principles are the rules to be observed in a given context. As stated in 6.1, certain principles were formulated by thinkers who designed new schemes for library classification. They felt that such principles would help them in designing their scheme of classification in a scientific way. Even classifiers observe some normative principles while classifying documents according to a scheme of classification.

According to Krishan Kumar these principles can serve the following purposes :

(i) They can serve as the basis of a classification scheme. As such the schedule of a scheme should be compiled by a classificationist, keeping in view the spirit of these principles.

(ii) Critical study of a given scheme of classification can be carried out with the help of these principles.

(iii) Principles can provide guidance to a classifier in the day-to-day work of classification, such as giving a class number for a new subject.

(iv) A given class number can be interpreted on a scientific basis with the assistance of the normative principles.

(v) The principles can be very helpful in critically comparing schedules of different schemes of classification.

Laws, Canons and Principles

Words like 'laws', 'canons', 'principles' and 'rules', are used almost synonymously. All these come under the category of normative principles.

In his *Classified Catalogue Code* (Ed. 5) Ranganathan explains as to why the term, 'canons', is used for his normative principles. He says "A word of explanation about the choice of the term, 'canons', to denote 'Normative Principoles'. The following is the convention adopted about the term to be used to denote normative principles in different contexts.

Law - In the context of a major discipline, such as Library Science.

Canon - In the context of divisions of the first order of the major discipline, such as Book Selection, Classification, and Cataloguing.

Principle - In the context of divisions of the second or later order of the major discipline such as 'Facet Sequence in Classification and Alphatetisation in Cataloguing".

Ranganathan used these different terms to match different levels of the thinking process Look at the Table given below:

	Level	Name of the Normative Principle
1.	Basic process of thinking	Basic Laws
2.	Library Science	Fundamental Laws
3.	Classification	Canons
4.	Helpful sequence in array	Principles
5.	Work of Classifying	Postulates and Principles for facet sequence.

As you observe this method of naming the normative principles you will notice that as the level of thinking comes down from the highest order to the lower practical level the names range as 'laws', 'canons', 'principles' and 'postulates'. In other words, we move from general to specific as we move from laws to postulates.

Basic laws are the principles which are general and applicable to any given situation in any context. They are based on logic and rational thinking. Ranganathan, however, thought of further sharpening the idea of Basic Laws to that of Fundamental Laws. Fundamental Laws are principles or rules which are considered applicable at the level of a discipline. Five Laws of Library Science are Fundamental Laws for the discipline Library Science.

9.3 BASIC LAWS

Ranganathan identified the following basic laws :

Laws of Interpretation

Law of Impartiality

Law of Symmetry

Law of Parsimony

Law of Local Variation

Law of Osmosis

Now let us see how these basic laws can be applied in the context of classification theory.

According to Ranganathan, the laws of Interpretation are those which are well known principles applicable to the resolving of problems in certain situations. He cites the example of the 1008 principles of interpretation listed in classical works like *Nyayakosha*.

The Law of Impartiality is the principle which shall guide us in cases where options are equal between two facets of a subject or where the needs of different groups of users are of equal importance. In all such cases the principle says that the classificationist or the classifier should be impartial in his preferences.

According to the Law of Symmetry, of two entities or situations which admit of being regarded as symmetrical counterparts of each other, if one of them is given weight in some context, the other one also should be given a corresponding weight.

The Law of Parsimony speaks of economy. When options are available between two or more possible alternatives the Law of Parsinomy says that the one that brings in overall economy of man-power, material, money and time considered together with proper weightage is to be preferred.

The Law of Local variation is "the principle that in any discipline and technique there should be provision for the users of them to secure results alternative to those for general use, the provision being strictly in the context of local use".

The Law of Osmosis is the principle which is applicable when a library opts for a change in the catalogue code to be followed or the scheme of classification to be followed.

For example, imagine a situation in which a library having a sufficiently large collection classified according to Dewey Decimal Classification and has Dictionary Catalogue but later wants to switch over to Colon Classification and Classified Catalogue Code. Then the problem is how to bring about the change without causing much inconvenience to the users. The Principle of Osmosis provides for a smooth transition.

The Law Says :

1. All the new accessions be catalogued and classified according to the new Catalogue Code and the new Scheme for Classification.
2. Just those of the old collection as are known to be in much use be re-catalogued and re-classified with an additional temporary staff, if necessary, during the first few months.
3. The new accessions and the re-catalogued and re-classified books be kept in a New Collection and similarly their catalogue cards too be kept in a New Collection.
4. The rest of the old collection be kept as Old Collection and similarly their catalogue cards too be kept as Old Collection.
5. Readers attention be invited by the Reference Librarian to the existence of the two collections; and
6. If any book is taken out by a reader from the Old Collection on its return by him it be re-catalogued and re-classified and absorbed in the New Collection, and similarly with its catalogue cards.

As you study the subject of library and information science you will realise how important these laws are Ranganathan followed these laws in his different works. For example, you notice that the Law of Local Variation and the Law of Parsimony and other laws are followed on several occasions in his works on library classification and library cataloguing.

Self-Check Exercise-1

(a) State in two lines the essence of "Law of Parsimony" and "Law of Local Variation".

Note : i) Write your answers in the space given below.

ii) Compare your answers with the Model answers given at the end of this Unit.

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(b) In what context the 'Law of Osmosis' will be helpful ?

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9.4 FUNDAMENTAL LAWS

Rules or principles that govern a discipline, according to Ranganathan, may be called "Fundamental Laws". For Library Science discipline his five Laws of Library Science are the Fundamental Laws. Students of Library Science will be knowing in great detail about these Five Laws. In fact, any one who knows a little about library science quotes these laws because these statements, though very simple, are striking and memorable.

The Five Laws of Library Science are :

1. Books are for use;
2. Every Reader his or her Book;
3. Every Book its Reader;
4. Save the Time of the Reader; and
5. Library is a growing organism.

These laws you might have already heard about or even might have got by heart by now. They will be discussed in detail in Course-1 'Library and Society'.

9.5 CANONS OF CLASSIFICATION

9.5.1 Rules for Division

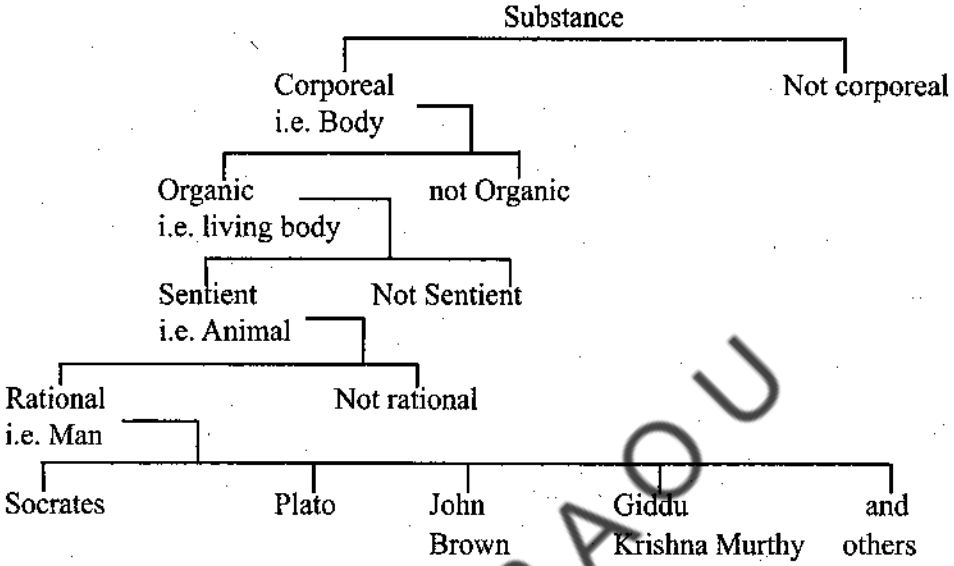
Before we try to understand the canons of classification enumerated by Ranganthan we will have to understand what goes into classification. One way of classifying things is to bring together like things and separating unlike things. We can bring together like things by identifying a quality or characteristic and then applying that for dividing things. For example, in a class room the students are classified as boys and girls by applying the characteristic, 'sex', of the

student. Similarly, by applying colour of the shirt as a characteristic we can classify all the boys into different groups.

The classification of books in a library in the early days as already stated was more or less based on such a principle of applying a characteristic to bring together books bearing the same characteristic.

Tree of Porphyry

Dichotomy or dividing into two classes at every step was considered to be the best way of classification at one time. A well known example for such a division is the "Tree of Porphyry". This is how it can be shown :



When such a division of things is thought of it is felt that the listing of a term in a scheme of classification should follow the following rules of division in order to be useful.

1. Each step must be based upon a single principle of division. That is to say, the characteristic must be used consistently at each step of the division.
2. Co-ordinate classes must be mutually exclusive.
3. Co-ordinate classes must be collectively exhaustive.

9.5.2 Sayers' Canons

The Rules of Division suggested by Sayers which he called 'Canons of Classification' are set down hereunder :

1. Division proceeds from terms of great extension and small intension to terms of great intension and small extension.
2. The process must be gradual, each term modulating into the term following, it, and the whole perfectly coordinated.
3. Characteristic chosen as the basis of division must be essential to the purpose of classification.
4. Characteristics must be consistent.
5. Terms used must be mutually exclusive.
6. Enumeration of parts must be exhaustive.

These principles of divisions were no doubt based on those basic principles which have been observed in the Tree of Porphyry for centuries.

9.5.3 Ranganathan's Canons

Ranganathan with his meticulous attention to details looked at the problem of canons for classification from two relevant angles, namely, the theoretical foundation and the practical requirements while classifying documents. He has further identified that when we think of classification we look at three planes - the idea plane; the verbal plane and the notational plane.

Before a concept or idea materialises into a word or word group it will be thrashed out at the mental level which Ranganathan calls 'the idea plane'. When it materialises and is spelt out it is 'the verbal plane'. In a classification scheme the concept so materialised will have to be given a notation or a symbol. This plane is what Ranganathan calls 'notational plane'.

Therefore, Ranganathan enunciated canons for classification at these various planes. Unit 3.7 and its subdivisions of this Course set forth to how many canons Ranganathan has provided for each of these planes of work. Now, we shall try to understand in brief what these canons are.

9.6 CANONS FOR IDEA PLANE

At the idea plane we observe that any scheme of classification has to consider the following if the scheme were to be designed scientifically :

(a) Characteristics

(b) Succession of characteristics

(c) Array of classes

(d) Chain of classes and

(e) Filiatory sequence

To explain it further when people, objects, ideas or concepts are to be grouped together in a logical way we will have to take each time a particular quality or characteristic and then group those that fulfil that characteristic at one place. Once the division of the total universe is exhausted with that characteristic we apply another characteristic, thereafter another characteristic and so on. For example, if we want we can divide the student community of a very big university first by the courses which they joined; then by sex (whether the student is boy or girl) then age; married or unmarried; income group and so on.

When many characteristics are used we will face the problem of deciding the succession of the characteristics. That is to say in the above example whether age is to be considered first or sex or course taken or marital status, etc.

When the classes so arrived at are arranged in a horizontal way it is known as 'array of classes' and when arranged one below the other the arrangement is known as 'chain'. When we say array or chain arrangement of classes it is not as though we could do it arbitrarily. Classes in an array are usually coordinate in status while those arranged in a chain indicate subordinate status. In the subsequent units of this Course you will get to know more about the arrays and chains.

When finally the universe is arranged into arrays and chains of classes the arrangement should be such that there is affinity between every class and its adjacent class. This is what Ranganathan calls "Filiatory Sequence".

At the Idea Plane Ranganathan has enunciated five sets of canons.

6.6.1 Canons for Characteristics

The Canons for characteristics are :

i) Canon of differentiation

ii) Canon of relevance

iii) Canon of ascertainability

iv) Canon of permanence

i) Canon of Differentiation

This canon may be stated as follows :

"A characteristic used as the basis for the classification of a universe should differentiate some of its entities - that is, it should give rise to at least two classes or ranked isolates".

This simply means that one should not use a characteristic which, when applied, will not result in any division of the universe.

ii) Canon of Relevance

This canon says :

"A characteristic used as the basis for the classification of a universe should be relevant to the purpose of the classification".

For dividing any universe several characteristics can be made use of. This canon says that we will have to choose a characteristic that is relevant to the purpose of classification. In the example of the university students mentioned earlier the dress of the students may not bear any relevance to the pointing out of students who are more intelligent than the others. But sex (whether girls are more intelligent or boys are more intelligent) may be relevant.

iii) Canon of Ascertainability

This canon says, "A characteristic used as the basis for the classfication of a universe should be definite and ascertainable".

Suppose the universe is rural illiterate population and you want to take date of birth as the characteristics do you think that you can divide the population on that basis. Most of the people may not be knowing when they were born and so the date of birth cannot be used as a characteristic.

iv) Canon of Permanence

This canon stresses the need for using only such a characteristic which will result in classes which are permanent. For example, if colour of dress the students wear is taken as a characteristic for classifying students in a class then the classification will not result in any permanent grouping of the students. The colour of the dress may change from day to day.

6.2.2 Canons for Succession of Characteristics

Ranganathan has enunciated canons for succession of characteristics also. They are three in number, and are as given below :

i) Canon of Concomitance.

ii) Canon of Relevant succession

iii) Canon of Consistent succession

These are applicable to any universe of entities, of basic subjects, of isolate ideas, of compound subjects or complex subjects.

i) Canon of Concomitance

According to this canon "no two characteristics should be concomitant, that is, they should not give rise to the same array of subjects or of isolate ideas".

For example, if we apply the year of birth and the age as the two characteristics for group of people to be classified we get the same classification. Here the characteristics, year of birth and age, are concomitant.

ii) Canon of Relevant Succession

According to this canon, "The succession of the characteristics in the associated scheme of characteristics should be relevant to the purpose of the classification".

In literature class, in both DDC and CC, we observe that this canon has been observed. In DDC the succession of characteristics used for literature is language, form and period. Similarly, in CC in literature class you find the succession of such characteristics as language, form, author, and work.

iii) Canon of Consistent Succession

This canon stresses the need for following the succession sequence consistently without arbitrarily changing the sequence. Stating the canon Ranganathan observes "the succession of the characteristics in the associated scheme of characteristics should be consistently adhered to, so long as there is no change in the purpose of the classification".

9.6.3 Canons for Array

Ranganathan thought of four canons for each array of classes in a scheme for classification. They are :

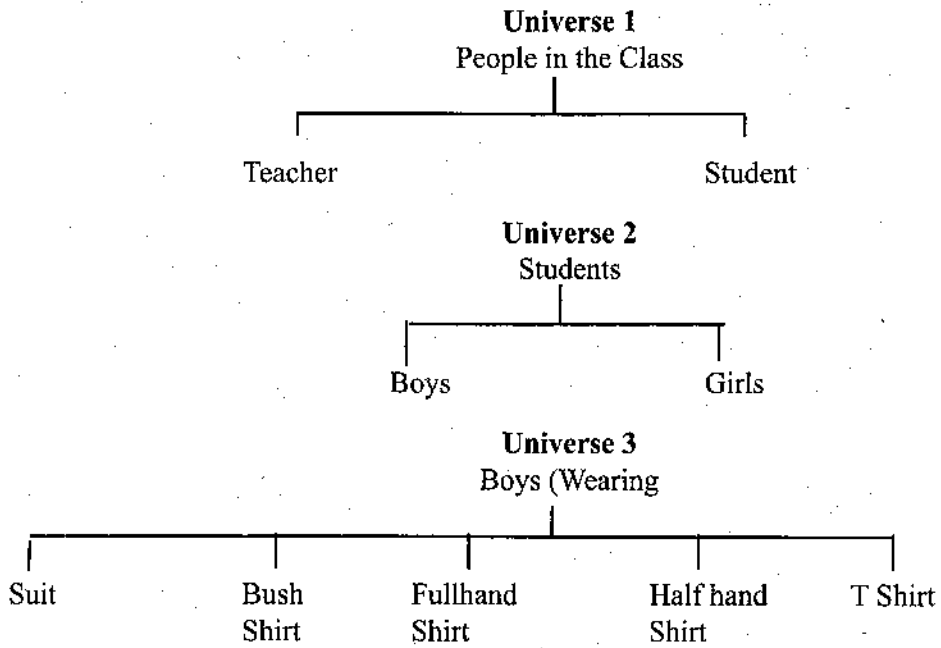
i) Canon of exhaustiveness
ii) Canon of exclusiveness
iii) Canon of helpful sequence
iv) Canon of consistent sequence

These four canons are such broad principles that we can apply them in any context of classification. The universe of entities the universe of subjects; the universe of isolate ideas; the universe of compound subjects and the universe of complex subjects.

i) Canon of exhaustiveness :

This canon says that in any array of classes or isolates all of them should together complete their respective immediate universe.

Look at the examples given below :



Each of the universes complete when the classes in the concerned arrays are put together. In Universe 3 the classes in the array should exhaust all the boys in the universe without leaving out any one of them.

ii) Canon of Exclusiveness

This canon says that the classes in an array of classes and the ranked isolates in an array of ranked isolates should be mutually exclusive.

Now look back at Universe 3. In the array the class of those boys who are in a suit is given. But a person wearing a suit might be having full hand shirt or half hand shirt or even a T-Shirt inside the coat he is wearing. So when the count is taken some of the boys wearing the suits are to be counted taking into account boys with full hand shirts or with those wearing half hand shirts inside the suit; may be some of them might be wearing T-Shirts. If the characteristic used for classification is the type of shirt worn the array of classes will be mutually exclusive and there will be no overlapping of entities.

iii) Canon of Helpful Sequence

As regards the canon, Ranganthan states that "The sequence of classes, and of ranked isolates in an array of ranked isolates should be helpful to the purpose of those for whom it is intended".

In what he calls APUPA arrangement, Ranganathan gives an example of a helpful sequence. He states that the user would like to have fanned out on either side of umbral region the subjects, having successively a decreasing bearing on the umbral subject. The two regions - on either side of the umbral region - may be called 'penumbral' regions and the subjects in them 'penumbral subjects'. "The penumbral regions will ultimately thin out into the alien regions on either side".

At any point in the shelf arrangment you should so find the books on the subject of your interest would have also books on closely related areas on either side. This is what in essence is the APUPA arrangement.

Ranganathan enunciated several guiding principles to help us implement the canon of helpful sequence. They are

1. (a) Principle of later-in-time;
   (b) Principle of earlier-in-time.
2. (a) Principle of later-in-evolution;
   (b) Principle of earlier-in-evolution;
3. Principle of spatial contiguity;
4. (a) Principle of increasing quantity;
   (b) Principle fo decreasing quantity;
5. (a) Principle of increasing complexity or principle of decreasing simplicity;
   (b) Principle of decreasing complexity, or principle of increasing simplicity;
6. Principle of traditional or canonical sequence;
7. (a) Principle of decreasing literary warrant;
   (b) Principle of increasing literary warrant;
8. Principle of alphabetical sequence.

Subsequently, some more principles are added to these principles which will be useful for realising a helpful sequence. These are enunciated by Neelameghan as follows:

1. (a) Principle of increasing concreteness (or pure discipline - applied discipline sequence), or principle of decreasing abstractness (or applied discipline - pure discipline sequence).

   (b) Principle of decreasing concreteness, or principle of increasing abstractness;

2. (a) Principle of decreasing extension, or principle of increasing intension;

   (b) Principle of increasing extension, or principle of decreasing intension;

3. (a) Principle of developmental sequence; and

   (b) Principle of reverse developmental sequence;

4. (a) Principle of increasing artificiality, or principle of decreasing naturalness; and

   (b) Principle of decreasing artificiality or principle of increasing naturalness.

5. (a) Wall-picture principle;

   (b) Actand - action - actor - tool principle;

   (c) Whole-organ principle; and

   (d) Cow-calf principle.

Many of these principles will be discussed in detail in the subsequent units of this course.

iv) Canon of Consistent Sequence

This canon says that "whenever similar classes or ranked isolates occur in different arrays, their sequence should be parallel in all such arrays, wherever insistance on such a parallalism does not run counter to other more important requirements".

This canon will help us achieve economy of time and minimise the load on memory. Ranganathan followed this canon to a large extent in his *Colon Classification.* For example, arrays in Biology and Medicine; or, again in Botony and Zoology will have several parallel sequences.

Example

Medicine	**Biology**
Preliminaries	Preliminaries
Morphology	Morphology
Physiology	Physiology
Disease	Pathology
Public health and Hygiene	Ecology
and so on.	

Even Dewey Decimal Classification (DDC) and Universal Decimal Classification (UDC) follow such parallel sequences of arrays. But the Library of Congress scheme of classification (LC) does not follow parallel sequences of arrays.

Self-Chek Exercise-2

(a) Name the canons for characteristics at the level of the Idea Plane.

Note : i) Write your answers in the space given below.

ii) Compare your answers with the model answers given at the end of this Unit.

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b) What is meant by APUPA pattern of arrangement ?

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9.6.4 Canons for Chain

Ranganathan proposed two canons for chain of classes of ranked isolates. They are

i) Canon of decreasing extension; and

ii) Canon of modulation

These canons again are applicable to the classification of entities, the universe of basic subjects, the universe of isolate ideas, the universe of compound subjects, and the universe of complex subjects.

Let us once again remember that in an array the entities are arranged in a horizontal sequence while in a chain they are arranged in a vertical sequence one below the other. So, the canons for chain are relevant to a vertical sequence.

i) Canon of decreasing extension

This canon says that "while moving down a chain from its first link to its last, the extension of the classes or of the ranked isolates, as the cases may be, should decrease and the intension should increase at each step".

In this statement two terms, 'extension' and 'intension' are used. In normal usage you might have heard these words. Extension indicates width or vastness and intension indicates narrowness or depth. In the present context extension refers to the number of entities or range concerning a class or ranked isolate. Intension refers to the number of characteristics used to derive a class or ranked isolate from the original universe. Extension is a quantitative measure of a class or ranked isolate while intension is a qualitative measure.

To give some examples :

India is of greater extension than Hyderabad city. See the chain below :

India

South India

Andhra Pradesh

Hyderabad City

Similarly :

Literature

Indian Literatue

Dravidian Literature

Telugu Literature

Telugu Poetry.

This canon, we should remember, is applicable to classes or ranked isolates within the same chain.

ii) Canon of Modulation

Ranganathan states this canon as follows :

"A chain of classes or ranked isolates should comprise one class or one ranked isolate, as the case may be, of each and every order that lies between the orders of the firts link and the last link of the chain".

Ranganathan also enunciates this canon using a concept known as "resolving power". The canon says in that context that "a chain of classes or of ranked isolates should be derived from the immediate universe with the use of lowest resolving power at each stage of division. Resolving power is the "power of recognising the classes or ranked isolates appropriate to the array of the first order of an immediate universe".

In other words, the chain should resolve itself in such a way that there are no gaps and jumps in between one order and the order next to it.

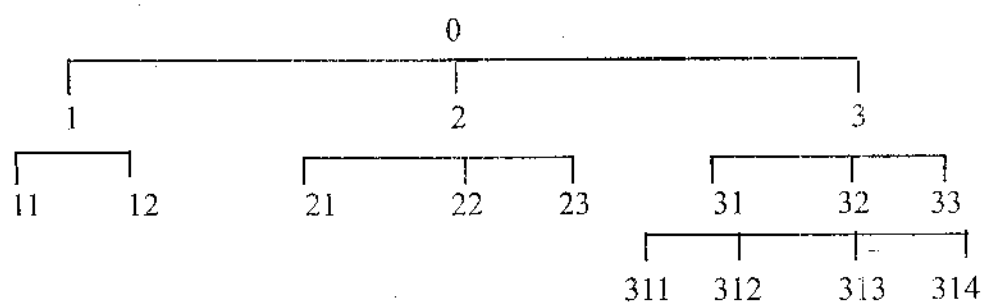
9.6.5 Canons for Filiatory Sequence

These canons are intended to bring together closely related arrays and chains. Both coordinate classes and subordinates classes need arrangement in such a way that filiation or near relation is indicated.

i) Canon for Subordinate classes

To explain this canon with the help of an example is much easier. Suppose the original universe is denoted by classes 0 (array of order 0). Then classes 1,2,3,.....9 belongs to the array of order 1. Sub-clsses 11,12,13.....19; 21,22,23.....; 31, 32, 33.....; 41, 42, 43, 44..... and so on belong to order 2.

See the illustration below :



A coalesced array would consist of classes in the order of 1, 11, 12, 2 21, 22, 23, 3, 31, 311, 312, 32, and 33.

According to the canon of subordinate classes in such a coalesced array if 31, 311, 312, 313 and so on are the sub-classes of 3 originating in one or other of the chains from class 3, then classes 31, 311, 312, 313 should immediately follow Class 3.

ii) Canon for Coordinate Classes

The canon for coordinate classes further elaborates the canon for subordinate classes. The canon says that if in a coalesced array classes 31, 32 and 33 had originated in one and the same array and had been consecutive in it then the classes 31 and 32 should not be separated from each other by any class other than classes 311, 312, 313 and so on having 31 as their common immediate universe.

9.7 CANONS FOR VERBAL PLANE

While the canons for Idea Plane are general principles that are applicable to classification in general the canons for verbal plane are concerned with the terminology to be used to name the classes or ranked isolates in any scheme of classification. These canons are of real use to both classifiers and classificationists for their work at the verbal plane.

Classificationists designing or revising schemes of classification will have to keep these in mind while doing their work. Similarly, the classifiers at the time of applying a scheme of classification for classifying documents can take these canons as their guiding principles in interpreting the terms in the schedules.

Ranganathan enunciated the following canons for work at the verbal plane :

1. Canon of Context
2. Canon of Enumeration
3. Canon of Currency
4. Canon of Reticence

9.7.1 Canon of Context

This canon says "The denotation of a term in a scheme for classification should be determined in the light of the different classes or ranked isolates of lower order (upper links) belonging to the same primary chain as the class or the ranked isolates denoted by the term in question".

This canon assumes importance because there will be several terms that denote entities by the same term though the context is different. For example. 'disease' is a term which can be used in the context of human beings, plants, animals and so on. Similarly, terms like pathology, physiology may be used to convey the same idea but in different contexts. So the canon says that such terms should be understood in the appropriate context.

This canon has another advantage also. Since a term is to be understood in the context in which it is used in the list of isolates in a schedule the term used in the upper link need not be repeated again and again in the lower links.

Example : (In CC)

B7 Mechanics
Foci in [P]
5 Liquid
51 Perfect
55 Compressible
56 Viscous

It will, therefore, achieve economy in listing the schedule satisfying the 'Law of Parsimony' of Ranganathan.

9.7.2 Canon of Enumeration

A classifier has to understand the denotation of a term in the scheme of classification by the range which is represented by its sub-classes or ranked isolates. Different schemes of classification may denote this range differently. Hence this canon says that the denotation can be understood only from the enumeration of sub-classes or ranked isolates under a term.

The canon says, "The denotation of a term in a scheme for classification should be determined and should be left to be determined in the light of or through the sub-classes or ranked isolates (lower links) enumerated in the various chains having the class or ranked isolates, as the case may be, denoted by the term in question as their common link".

9.7.3 Canon of Currency

This canon is very easy to understand. It says that "the term used to denote a class or ranked isolate in a scheme for classification should be the one current among those specialising in the subject field covered by the scheme".

That is to say, terms used in a scheme of classification to denote a class or ranked isolate should be the terms which are in use by the subject specialists of that branch of knowledge, otherwise, it will be very difficult for the classifier to use the scheme for classification. You should remember that it is possible that a term which is in use at present may become obsolete after some years. For example, at one time 'Natural Philosophy' was the term used for 'Science'. Library science in the beginning was known under the term 'Library Economy'.

This canon also implies that the classificationists should revise their schemes periodiocally to not only meet the requirements of new knowledge that may emerge but also to replace unused and obsolete terms in the scheme with current terms. Even in cataloguing, subject headings are to be revised taking into account current terms every now and then.

9.7.4 Canon of Reticence

The term, 'reticence', means 'keeping silent'. Hence in the context of this canon it means that a classificationist should not be critical and avoid using terms which may give rise to a controversy at present or in future. In some earlier editions. *Dewey Decimal Classification Scheme* used the term 'minor authors' which brooded the criticism as to how any one could be called a minor author. If a person were to be called minor author because of his limited number of publications; then who can say that he will not publish many more books in the near future?

Ranganathan stated the canon as follows : "The terms used to denote a class or a ranked isolate in a scheme for classification should not be critical - that is, express any opinion of the classificationist".

Self-Check Exercise-3

State in two lines each the principles behind the 'canon of currency' and the 'canon of reticence'.

Note : i) Write your answers in the space given below.

ii) Compare your answers with the model answers given at the end of this Unit.

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9.8 CANONS FOR NOTATIONAL PLANE

The third Plane of activity visualised by Ranganathan is the Natational Plane. Classes, subclasses and isolates having been formulated at the Idea Plane are resolved at the verbal plane as to the context in which they are to be considered. At the verbal plane the need for using proper terms is emphasised. The canons relating to Notational Plane lay down principles relating to the notation of a classification scheme.

Ranganathan enunciated several canons for notation. The basic canons for notation are as follows :

I. (a) Canon of synonym; and
   (b) Canon of homonym.

II. Five pairs of canons :
   (a) Canon of relativity and canon of uniformity;
   (b) Canon of hierarchy and canon of non-hierarchy;
   (c) Canon of mixed notation and canon of pure notation;
   (d) Canon of faceted notation and canon of non-faceted notation; and
   (e) Canon of Coextensiveness and canon of underextensiveness.

Let us briefly examine what these canons mean.

9.8.1 Canon of Synonym and Canon of Homonym

Canon of Synonym : This canon says that a subject or an isolate idea should have a unique number. The same idea or subject should not allow itself to be represented by more than one notation.

The point is very simple - a document if it is given two or more class numbers cannot be shelved at all the places at the same time.

The canon says "The class number of a subject in a system of class numbers and isolate number of an isolate idea in a system of isolate numbers should be unique".

However, Ranganathan himself has given option to the classifier to use "2" to represent mother country of the library when space isolates are to be used. Thus in our country libraries have the option to use "2" or "44" as space isolate while constructing the class number.

In respect of the other schemes of classification, Bliss classification provides for synonymous class numbers under alternative locations and alternative methods of treatment. Similarly, the U.D.C. intentionally provides for alternate locations.

Example : Engineering Mathematics can have the class number. : 62:51 or 51:62

Canon of Homonym : This canon says "the subject represented by a class number in a system of class numbers and the isolate idea represented in a system of isolate numbers should be unique".

If canon of synonym says that a class or isolate idea should be given a unique number the canon of hononym says that the subject or isolate idea represented by a number should be unique. No class number should represent two or more subjects. Similarly, no isolate number should stand for two or more isolate ideas.

In a faceted scheme of classification like CC or UDC homonyms are avoided to a large extent. But in a non-faceted scheme it will be difficult to avoid homonyms. Further, if there is a restriction on the length of class number the same number may have to represent two or more subjects giving scope for the occurence of homonyms.

9.8.2 Canon of Relativity and Canon of Uniformity

Now, we will consider some of the canons of notation in pairs. In a sense, these canons conflict with each other and we will have to take the appropriate canon on each occasion.

Observe the following two canons as stated by Ranganathan :

Canon of Relativity - "the number of digits (including digit - group treated as a single unit) in a class number or in an isolate number should be the same as the order of the subject or the isolate idea, as the case may be, represented by it".

Canon of uniformity - "the number of digits in a class number or in an isolate number should be constant whatever be the order of the subject or the isolate, as the case may be, represented by it".

The canon of relativity if followed by schemes like CC, DDC and UDC, but some of the schemes like LC, SC and RIC do not follow the canon to a great extent. Conflict arises between two canons when we are to consider the length of the class numbers. The Canon of Relativity has the advantage in the sense that for broader subjects of generalist interest it pleads for provision of shorter class number. In Library classification the Canon of Relativity gets preference over the Canon of Uniformity.

9.8.3 Canon of Hierarchy and Canon of Non-hierarchy

With regard to the Canon of Hierarchy Ranganathan suggests that a class number should represent each of the characteristics used in constructing the number. The canon says, "In a class number or in an isolate number, there should be a digit to represent each of the characteristics used in constructing the class number or the isolate number, as the case may be".

However, Ranganathan's Colon Classification itself violates this canon occasionally, Particularly, the concept of 'Tele-scoping of Array' used by him comes in the way of the Canon of Hierarchy. Consider the following example :

1 World
4 Asia
5 Europe
6 Africa
7 America
8 Australia

Here the isolate 'world' is further divided into geographical continents. So, they should be represented by the digits.

14 Asia
15 Europe
16 Africa and so on.

But they are represented without the digit I in the beginning. Two different arrays are telescoped into one array here.

Ranganathan defines a telescoped array as "an array of classes in schedules of classification, made of coordinate and subordinate isolates, as viewed from the idea plane, but whose class numbers appear to be coordinate as viewed from the notational plane".

The canon of Non-Hierarchy speaks of the opposite hierarchy. It says, "In a class number or in an isolate number, there need not be a digit to represent each of the characteristics used in constructing the class number or isolate number, as the case may be".

As example we may say that BC and LC follow this canon at many places.

9.8.4 Canon of Mixed Notation and Canon of Pure Notation

In Block III you will come to know in detail 'Notation'. In Unit 10 the concept and definition of Notation are discussed in detail and you will also come to know about different types of notation in that unit. Pure notation uses only one species of symbols, say all Arabic numerals, or, all alphabets of a single language; or all Roman numerals, etc. In mixed notation two or more species of symbols are used as the notational base. Ranganathan enunciated two canons for the two different types of notation.

The Canon of Pure Notation says that "the base of the notational system of a scheme for classification should use one and only one species of digits". The Canon of mixed Notation says that "the base of the notational systems of a scheme for classification should use two or more species of digits".

At one time pure notation base was considered very advantageous. DDC uses pure notation of Arabic numerals. But there are few occasions when it suggests the use of alphabets also to further sharpen a class number. Now-a-days with the expansion of the universe of knowledge mixed notation comes in handy to achieve a better notational base. Many schemes for classification like LC, EC, SC, CC and BC use mixed notation. DDC and UDC have a short base while CC has a long base consisting of Arabic numerals, Roman capital letters, Roman small letters and even a Greek symbol "△" to denote the subject Mysticism.

9.8.5 Canon of Faceted Notation and Canon of Non-Faceted Notation

The Canon of Faceted Notation says, "A faceted notational system should be used when (1) the length of the base of the notation is about 10 and the universe is likely to contain more than a million entities or subjects, and (2) length of the base is about 56 and the universe is likely to contain 1,000 million or more entities or subjects".

The Canon of Non-Faceted Notation says, "A non-faceted notational system may be adequate when the (1) length of the base of the notation is about 10 and the universe is likely to contain not more than a million entities, and (2) the length of the base is about 56 and the universe is likely to contain not more than 1,000 million entities".

These two canons speak of situations where the number of digits in a class number exceeds 10 digits and where it does not exceed 10 digits. If the number of subjects is likely to be very large or where the number of digits in the class number is likely to be more than 10 digits a faceted notation is prescribed. Such a notation system will break the class number into blocks which are distinctive and which convey meaning. The resultant notation will help relieve the strain on the eye of the user resulting from looking at a monotonous large class number.

9.8.6 Canon of Coextensiveness and Canon of Under-extensiveness

The Canon of Coextensiveness says that the class number should be coextensive with the successive characteristics used to arrive at the class. In other words, this canon says that the class number should reflect the succession of characteristics. Earlier, you have come to know at Section 6.8.1 of this Unit a canon known as Canon of Homonym. You will now know that if the Canon of Coextensiveness is satisfied then the Canon of Homonym is also satisfied.

The Canon of Coextensiveness says, "In a class number, digits should be added successively so as to represent the measure of incidence of even the very last characteristic in the succession of characteristics admitted by the universe classified and relevant to the purpose of the classification".

The Canon of Under-extensiveness says, "In a class number; it is not essential that the digits should be continued so as to represent the measure of incidence of the later characteristic in the succession of characteristics, admitted by the universe classified and relevant to the purpose of the classification".

Close *Versus* Broad Classification

The Canon of Coextensiveness leads to an idea known as 'close classification'. That is to say, when a document is classified the digit representing each successive characteristic should find a place in the class number in a close classification. When a document is closely classified the class number can be translated back into the verbal plane without any omision. Ranganathan's CC attempts such a close classification. In a broad classification the class number is not coextensive with the succession of characteristics.

Broad and close classifications have advantages as well as disadvantages. In a small library, for example, there is no need for the use of close classification. Krishan Kumar says, "In order to solve the question of broad versus close classification, it has been generally agreed that there is a need for close classification schemes at two levels; one for macro thought and the other for micro thought. The Indian school of thought has produced close classification at two levels - one for macro-thought (CC) and the other for micro-thought (called depth schedules)".

Self-Check Exercise-4

(a) In about two lines bring out the difference between the Canon of Synonym and the Canon of Homonym.

Note : i) Write your answers in the space given below.

ii) Compare your answers with the model answers given at the end of this Unit.

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(b) State in two lines what is meant by "Telescoping of Array"

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(c) Explain briefly the terms 'Close classification' and 'Broad classification'.

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9.8.7 Canons for Array and Chain

With the expansion of knowledge the universe of subjects grows at very fast rate. Any scheme of classification should be in a position to meet this challenge. Otherwise, the scheme becomes obsolete and will be no longer useful. Ranganathan envisaged this situation and enunicated canons for arrays and chains. He says that there should be scope for new isolate numbers being extrapolated or interpolated in arrays and chains. The canons he listed in this case are:

i) Canon of Extrapolation in Arrray;

ii) Canon of Interpolation in Array;

iii) Canon of Extrapolation in Chain;

iv) Canon of interpolation in Chain.

To meet the requirements of these canons schemes for library classifcation have used several devices and techniques. You will learn about them in Unit 11 of this Block. Here the canons are enunicated.

i) Canon of Extrapolation in Array

The Canon of Extrapolation in Array says, "An array of class numbers or isolate numbers should admit of any number of new coordinate numbers at any point in the array'.

This canon can be satisfied by means of gap device; mixed base, empty digit and by introduction of new species of digits.

iii) Canon of Extrapolation in Chain

This canon says " A chain of class numbers or isolate numbers should admit of the extrapolation of any number of successive links at its end. In other words, the notational system should admit of the chain, ending with any number, being lengthened to any extent found necessary".

The useful devices to achieve this canon are gap device and the decimal fraction device.

iv) Canon of Interpolation in Chain

This canon states " A chain of class numbers should admit the interpolation, of any number of links between any two consecutive links in the chain".

9.8.8 Canons for Mnemonics

On the notational plane mnemonics play a prominent role. The meaning of the word "mnemonics" is that it is an aid for memory. If a concept or isolate is repeated or occurs very often then one way of remembering its notation is to use the same digit for the concept or isolate idea wherever it occurs. In Unit 13 `Mnemonics' is dealt with in detail.

Ranganathan stated a general canon known as Canon of General Mnemonics. It says, "The digit or digit group to represent a specific concept in a class number (or any of its constituents) should be the same in all class numbers having that concept represented in them, provided that insistence on such consistent representation does not violate the more important requirements".

Kinds of Mnemonics

Four kinds of mnemonics are identified by Ranganathan. They are:

1. Alphabetical Mnemonics

2. Scheduled Mnemonics

3. Systematic Mnemonics

4. Seminal Mnemonics

The canons relating to these mnemonics and their explanation are given in Unit 13 of this Block.

9.9 SUMMING UP

Systematic study of the theoretical foundations of library classification enriches the subject. Some earlier classificationists tried to formulate certain principles for classification. Sayers popularised a term called 'canons' for such principles or laws. He enunciated canons for library classification. However, it was Ranganathan who death with the concept of canons for classification in considerable detail.

Ranganathan identified three planes of work in library classification. They are the Idea Plane, the Verbal Plane, and the Notational Plane. He enunicated canons for these three planes of work in library classification. In this Unit various canons for classification are enunicated by Ranganathan are stated and explained.

9.10 MODEL ANSWERS

1) (a) Law of Parismony pleads for economy. When options are available the one that brings overall economy of manpower, material and money should be preferred.

Law of Local Variation says that alternative provision may be made for a general technique or principle to the extent of local needs.

(b) Law of Osmosis will be helpful when a library changes its scheme for classification or cataloguing code from one scheme to another.

2) (a) Canon of Differentiation; Canon of Relevance; Canon of Ascertainability; and Canon of Permanence.

(b) In APUPA pattern of arrangement closely related subjects are arranged on either side of the main subject of interest.

3) Canon of Currency suggests that in a scheme for classification the terms used should be terms in current use. Obsolete terms should not be used.

Cannon of Reticence suggests that terms in a scheme for classification should not express any critical opinions.

4) (a) Canon of Synonym says that an idea or subject should be represented by a unique notation while Canon of Homonym says that a subject or idea represented by a number should be unique.

(b) In telescoping of array coordinate and subordinate classes should be represented by a unique notation while Canon of Homonym says that a subject or idea represented by a number should be unique.

(c) In close classification the succession of characterstics are notationally represented coextensively while in broad classification all the characteristics need not be represented. In broad classification Canon of Homonym is violated. Small libraries can go in for broad classification of documents.

9.11 ASSIGNMENTS

1) State the purposes which normative principles can serve in library classification,

2) Explain in brief the basic laws enunciated by Ranganathan for library classification.

3) Write an essay on Ranganathan's Cannons for Library Classification.

9.12 RECOMMENDED BOOKS

Krishan Kumar. *Theory of Classification.* New Delhi: Vikas Publishing House, 1983.

Philips, W. Howard. *A Primer of Book Classification.* 5th ed. London: Association of Assistant Librarians, (Section of Library Association), 1961.

Ranganathan, S.R. *Classified Catalogue Code with Additional Rules for dictionary Catalogue Code.* 5th ed. Bombay, Asia Publishing House, 1965 (Reprint 1990).

Ranganathan, S.R. *Elements of Library Classification.* 3rd ed. Bombay: Asia Publishing House, 1962 (reprint by Bangalore: UBS Publishers, 1990).

Ranganathan, S.R. *Prolegomena to Library Classification.* 3rd ed. Bombay: Asia Publishing House, 1967 (Reprint by Bangalore: UBS Publishers, 1990).

Sayers, W.C.B. *Manual of Classification for Librarians and Bibilographers.* 3rd ed. London: Andre Deutsch; Calcutta: Rupa & Company, 1962.

9.13 GLOSSARY

Basic Laws : Basic laws are the principles which are general and applicable to any given situation in any context.

Canons : A guiding principle derived from the normative principles of a subject.

Chain : In classification a hierarchy of terms in a classification system, each term including all those that follow it.

Idea Plane : When a concept or idea materialises into a word or word group it will be thrashed out at the mental level which Ranganathan calls it as ' Idea Plane'.

Notational Plane : In classification, after the concept was materialised, it has to be given a notation or a symbol. Ranganathan calls this plane as 'Notational Plane'..

Verbal Plane : It is Verbal Plane when a concept or idea materialises and is spelt out.

9.14 MODEL EXAMINATION QUESTIONS

I. ESSAY QUESTIONS

1) Explain briefly the canons for Idea Plane as expounded by Dr. S.R.Ranganathan.

2) Discuss the canons applicable to verbal plane.

3) Explain the importance of canons in notational plane.

II. SHORT NOTES

a) Tree of porphyry

b) Sayer's canons

BLOCK - III: NOTATIONAL DEVELOPMENT

Notation is an essential part of library classification. With the help of notation we can mechanise the arrangement of books on the shelves in the libraries in a most helpful sequence. In Unit - 10 you will learn about notation, its meaning, usefulness, kinds and qualities of a good notation and its development.

In Unit - 11 you will learn about the devices. Devices are used in number building. The devices also help in providing hospitality in chain and array. Further the use of the devices facilitates avoidance of enumeration to a great extent.

Mnemonics is the aids to memory. There is very much helpful for the construction of the schedules and number building. It plays very vital role in library classification in achieving filiatory/helpful sequence, consistent and parallel sequence of subjects.

In Unit - 12 you will learn about the result of the library classification process, that is the assigning of Call Number, which consists of Class Number, Book Number and Collection Number. In this Unit you will find various systems for deriving book numbers and also scheme of collection numbers.

UNIT - 10 : NOTATION - NEED, TYPES AND FUNCTIONS

Contents

10.0 AIMS AND OBJECTIVES

This Unit introduces you to the Notational System in library classification. It deals with the definition of notation, the need for the notation, functions and qualities of notation and it also presents a brief account of the development of notation.

After studying this unit, you should be able to:

- explain the importance of notation;
- identify various types and kinds of notations;
- use the notation of a classification scheme efficiently; and
- explain the functions and qualities of notation.

10.1 INTRODUCTION

Notation is a system of graphic sysmbols for a specialised use. The use of symbols or signs in the place of terms or phrases for special purposes is very much familiar to us. The symbols are preferred for the sake of convenience, economy and clarity or avoiding confusion. The convenience and helpfulness of symbols is evident from the use of house members for the easy location of houses, short hand symbols for speedy writing. Morse code for sending telegraphic messages, vehicles numbers, gas and electricity consumber numbers, chemical sysmbols, punctuation marks in language, musical notation, mathematical symbols etc. are well known to us. The use of numbers is convenient and helpful as they replace a multitude of particulars relating to the entity to which they are assigned. For instance when a vehicle is lost, we may lodge a complaint. For its identification no amount of description, such as vespa, blue, with a long seat, without a spare wheel, etc., would serve the purpose of finding the lost vehicle. Whereas, the vehicle number replaces all the particulars and one can be sure of finding the vehicle provided the number is not changed.

Thus, for the sake of convenience and helpfulness several disciplines use symbols on a large scale. Similarly, library classification is also one of the disciplines which uses notation on a large scale. Because the arrangement of books must be mechanised and helpful, by indicating the subordination, coordination and other relations, if possible, among the subjects. This could be possible only with the help of an effective notational system.

10.2 DEFINITION

Though the dictionary meaning of notation is a system of graphic symbols for a specialised use. The definitions given for the notation and used in library classification by the classification theorists are as follows:

According to Palmer and Wells: "Notation is a device for mechanising arrangement and must be composed of written symbols whose order is defined". Sayers defined notation as merely symbols standing in the place of terms. According to Ranganathan notation means "A system of ordinal numbers used to represent the classes in a scheme of classification". H.E. Bliss defined that "Notation is a symbol of marks or symbols in some order, denoting terms or members of a series or system of things: Margaret Mann, defined as "The symbol which stands for the classes and their subdivisions is called the notation of that scheme".

From the above definitions it is clear that notation is a set of ordinal numbers used to mechanise the arrangement of documents and also represent the classes and their subdivisions.

10.3 NEED FOR NOTATION

According to Ranganathan, "In a scheme of classes the subjects should be arranged in a helpful filiatory sequence on the basis of a scheme of successive characteristics". There is also the need to mechanise the arrangement of the collection in a library. He gives the following reasons for choosing the notational system in the place of the name of the subjects.

a) Unhelpfulness of Alphabetical Sequence

Alphabetical arrangement of subjects under their names is ruled out as the sequence it gives is not helpful.

Example : Let us examine the following sequence of classes which are arranged alphabetically.

Agriculture	Ecology	Philosphy
Arithmetics	Economics	Political Science
Astronomy	Epistemology	Sociology
Biology	Inorganic Chemistry	Statistics
Boating	Logic	Surgery
Botany	Mathematics	Ulcers
Chemistry	Medicine	Utopia
Democracy	Organic Chemistry	Zoology

b) Effect of change in the name of a subject

Alphabetical arrangement of subjects is also ruled out on the ground of the change the name of a subject.

The semantic changes are continually going on. Apart from subtle change of meaning in a word, the name of subject is often changed from time to time. For instance, "Natural Philosophy" has given place to "Physics", and "Political economy" to "Economics", as a result of which the above subjects more from 'N' group of subjects to 'P' group and 'P' group to 'E' group respectively.

c) Effect of synonyms on Alphabetical Sequence

Alphabetical arrangement of subjects is ruled out on yet another ground, as the names of subjects are not unique. One subject may be known by more than one name. For example 'Aves' and 'Birds', 'Ceramics' and 'Pottery' and 'Acoustics' and 'Sound'. Each pair of names of subjects mentioned above shows how the synonyms cause more than one location of a subject which is usually more unhelpful.

d) Effect of multiplicity of languages

The subjects are known by different names in different languages. That is to say the subject begins with a different letter. Accordingly, they go to different alphabets' groups. For example, in English 'Dry Cell' would go to 'D' and 'Tunning Fork' to the 'T' group. But in French the first one is known as 'Pile Seche' so it goes to 'P' group and the second one is known as 'Diapason' and goes to 'D' Group.

e) Effect of Homonyms on alphabetical Sequence

Lastly, alphabetical arrangement is ruled out for another reason that a term may stand for than one subject. Example 'Van' means the foremost or front division of a military or naval force. In this meaning itself it stand for both military and naval forces and further the terms also stands for a covered vehicle, usually a large truck or trailer, used for moving furniture, goods, animals, etc. Thus, there will be collacation of unrelated subjects because of homonyms.

f) Unhelpfulness of alphabetico-classed sequence

As the above reasons indicate scatted among the related subjects, uncertain and unhelpful sequence of the documents on the shelves, one may resort to alphabetico-classed sequence which ensures collocation of related subjects. But then achieving a perfect alphabetico-classed sequence is not easily feasible. It requires considerable subject knowledge, with regard to the relation and order among the broader and minute subject divisions, on the part of the library

personnel who file documents on the shelves and also on the part of the users to retrieve the documents. Otherwise, the arrangement proves to be totally chaotic and unhelpful. Moreover, both filing and retrieval activity consumes considerably a lot of time and finally a perfect classified sequence can never be attained.

g) Necessity for Ordinal Numbers

Since the arrangement of subject in an alphabetical or alphabetico-classed order is unhelpful, there is need to think of an alternative. One of the best alternatives is use of ordinal numbers to mechanise the arrangement of subjects. Ordinal numbers are more useful since they "define thing's position in series". Here we must be clear about the difference between oridinal numbers and cardinal numbers. Cardinal numbers represent the quantitative value. Whereas, the ordinal numbers represent the place value of a thing in series, or in other words, the sequential value. Further, the concept of 'Decimal Fraction Notation' must be applied to the ordinal numbers for fixing the place value of each digit in a number which consists of more than one digit.

Self - Check Exercise - 1

What are ordinal numbers and cardinal numbers?

Note : i) Write your answer in the space provided below.

ii) Compare your answer with the model answer given at the end of this unit.

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10.4 KINDS OF NOTATION

For the purpose of library classification different types of notation with various qualities and characteristics were tested and used. However, the notation used must consist of well known or popular signs and symbols only, such as Indo-Arabic numerals (0-9), Roman Capitals (A-Z), Roman smalls (a-z) in addition to Greek letters ($\sum \Delta$, etc.), punctuation marks, mathematical symbols, etc., or a mixture of two or more species of symbols. Some of the important types of notation are discussed in the following sections.

10.4.1 Pure Notation

A notational system in which no class number contains more than one species of digits.

Example : 365 HOG ape

In other words it is the notational system which uses one and only one set of symbols, they may be (0-9) or (A-Z) or any other set of symbols which must be preferably universally known. Usually, it is better to avoid those symbols which are other than numerals or well known letters.

The advantages of pure notation are:

1. As these numerals are universally well known, they are internationally acceptable.
2. It creates no difficulty in conveying the order / sequence clearly.
3. They are relatively simple to write, type, read or pronounce and also to certain extent remember.

Inspite of their superior qualities, this notation too has certain limitations and disadvantages.

The disadvantages are:

1. It will always have longer class numbers, as they have a shorter base.
2. It cannot accommodate, at any level or time, more than 9 or 10 divisions. If we accommodate more than 9 divisions with the help of sector device, we will be giving a lengthy class number.
3. The capacity of the notational system would be less compared to that of mixed base.
4. It gives monolithic numbers. When the length of a monolithic (class) number is more it will be difficult to note and remember the number easily.

However, pure notation is the most preferred notation in practice. Fremont Rider is another staunch advocate of pure notation. He used 26 alphabets in his International Classification. He believes that pure notation has enromously contributed to the success of classification throughout the world. But the trend is to use mixed notation in the modern schemes of classification.

10.4.2 Mixed Notation

A notational system in which a class number may have two or more species of digits. In other words it is a notational system which uses more than one set of symbols.

Ex : N44,J8:6 P35:41

The advantages of this notation are :

1. Because of the large base the class numbers can be short.
2. At a given time we can have more than 9 divisions.
3. As it gives rise to polylithic numbers it is easy to read, remember and note/write.
4. The capacity of the notational system is considerably more compared to pure notation.
5. It has greater capability of synthesis.

Disadvantages:

1. It adds to the complexity of a notational system.
2. The ordinal value among the species of the digits has to be attributed. Since it is not universally known it will be confusing and also difficult to follow. Therefore, it requires fair knowledge of the same on the part of those who file documents on the shelves and also on the part of the users.
3. At times the mixture of different sets of digits causes confusion and also difficulty in remembering the class number.

10.5 TYPES OF NOTATION

Apart from the above mentioned two basic kinds of notational systems, there are various types of notation because, no notational system is totally compatible with the requirements of library classification. Therefore, there is a need to resort to some devices which enhance the capabilities and compatibility of notational systems. Accordingly based on various devices we have various types of notation named after their respective devices.

10.5.1 Integer Notation

In Integer Notation the place value of each digit in the host number is changed by adding an extra digit at its right end.

Example : Let us take 567 as host number and add digit 8 at its right end; then we derive the number 5678. When this number is taken as integer then the place value of 5, which was 500 changes to 5000; and that of 6, which was 6 changes 600 and so on. Integer notation does not gives rise to a helpful sequence as it cannot achieve collacation of subjects. Whereas, it was used in earlier times and it can also be used when the size of the collection is considerably small. Most of the popular schemes of classification do not use integer notation.

10.5.2 Decimal Fraction Notation

In Decimal Fraction Notation the place value of each digit in the host number remains unchanged by adding an extra digit at its right end.

Example : To the decimal fraction host number 567 if we add 8 at its right and we derive 5678, still the place value of the digits remain unchanged. In both the numbers the place of 5 is 5/10; that of 6 is 6/100, and that of 7 is 7/1000.

It is the Decimal Fraction Notation which is used in very popular library classification scheme. The concept of 'Decimal Fraction Notation' is also applied to mixed base. The use of Decimal Fraction Notation was contributed by Melvil Dewey and it is considered a remarkable contribution.

10.5.3 Hierarchical Notation

A hierarchical notation indicates the order of subordination among classes, by means of the length and structure of the class number. Besides subordination among classes it also indicates coordination among classes, in other words, it indicates both subordinate and coordinate classes. Decimal fraction notation can be termed as Hierarchical notation.

Example : B252 (in CC6) is a subdivision of B25. B25 is a subdivision of B2. Further B2 is a subdivision of B. This order indicates subordination among classes. When we take other divisions, such as, B2, B3, B4, B5, etc. this presents coordinate classes. The hierarchy can be represented by a chain, as given below:

B	Mathematics
↓	
B2	Algebra
↓	
B25	Higher Algebra
↓	
B252	Binary Higher Algebra

10.5.4 Non-Structural Notation

A notation which does not indicate hierarchy among classes is a Non-structural notation or Non-hierarchical notation.

Example : From BC2:

J Education

JH Teachers and Teaching

JI Teaching Methods and Aids

JJ Methods.

LC, SC and BC2 are the schemes which often make no attempt to express the structure among classes. Integer notation is also one of non-structural notation.

10.5.5 Faceted Notation

Multipartite notation with the blocks of digits connected by a meaningful connected digit, analogous to punctuation marks, each connecting digit indicating the distinctive character of the idea represented by the succeeding block of digits.

Example : From	UDC	338	(540)	"198"
		Economic Situation (of)	India (in) (Space) idea	1980s (Time) idea

10.5.6 Non-Faceted Notation

Non-Faceted Notation is the notation with all the digits written closely so as to from one block. It is alternative name for Unipartite Notation.

Example : From LC RC372 Epilepsy.

10.5.7 Group Notation

A decimal fraction notational system in which each number consists of two and only two rich digits; or three and only three rich digits; and so on; and does not include an empty digit. The numbers of a Group system are deemed to form a single array.

Example	11	12	.....	18
	21	22	.....	28
	81	82	.....	88

Examples: From CC6:

The best example of use of Group Notation is found in forming the array of isolates in [P] facet of 'J' Agriculture Class in (CC6). In which two characteristics of an entity are represented with the help of Group Notation.

Foci in [P] is formed by Group Notation, in which there are group numbers standing for various plants taken from utility array and part array of [P]. Thus 38 stands for Food seed (3 for Food, 8 for Seed, together they stand for) and 381 for rice 5 for oil, 58 for oil seed and 581 for Groundnut.

10.5.8 Restroactive Notation

Assuming an inverted schedule, successive numbers could be used to introduce successive facets, and these numbers would always be reserved as facet indicators so that each focus in a later facet would begin its own further division after the last reserved number. Such a notation, in which compounds are specified by simply adding earlier numbers to later ones, is called a "Retroactive notation".

Thus, Retroactive notation has been used to provide enough facility in constructing numbers for compound subjects. This has been achieved without using any characters or indicator digits other than the numbers and letters.

Example : From BC2

I)	J	Education
	JC	Administration of Educational Institutions
	JE	Educational Psychology
	JIE	Audio - Visual Aids
	JK	Curriculum
II)	JM	Primary, Elementary education
	JMN	Preparatory schools.

In order to construct numbers for compound subjects, numbers from I block can be attached to II block items. Further, it may be noted that divisions from JMA to JMM have been left vacant to accommodate the compound subjects.

The numbers for compound subjects will be constructed as below:

III)	JMC	Primary School Administration
	JMIE	Audio-Visual aids in primary education
	JMK	Curriculum in primary schools.

BC2 used retroactive notation largely. J. Mills is an enthusiast for retroactive notation.

10.5.9 Sector Notation

Sector notation is a notation which is used for increasing the capacity of an aarry with the aid of an Empty Digit.

(i) Empty Digit

A digit with ordinal value but without semantic value. Usually, the last digit of a species of digits is made an Empty Digit. Example : In 0, 1, 2, 3.... 9, 9 can be taken as an empty digit. In A,B,C....Z, Z is the empty digit. The digit 0 (Zero) also is used as an empty digit provided it is not used for any other purpose in a scheme.

(ii) Sectors

Sector Notation is a pure base of Indo-Arabic numerals.

Let us consider the sequence 123 .... 8 91 92 93 ..... 98 991 992 993 .... 998 etc., where we assumed 9 as the empty digit which has an ordinal value, but no semantic value. In other words, 9 by itself has no meaning except its place value, whereas 91 has meaning. Further, 91 92 ..... 98 991 992 ..... 998 etc., are considered as one unit (numbers) and so they represent coordinate classes along with the digits 1 2 3 ..... 8. The 1 to 8 range of the array is denoted by (S - 1) and is read as Sector (S - 1). Similarly, 91 to 98 is denoted by (S - 91) and so on. Similarly, we can have sectors by using Roman capitals, Roman smalls, and mixed base.

(iii) Concept of Zones

The concept of zone is derived out of the concept of sectors. Zones indicate various groups of sectors. The concept of zone helped to communicate idea of an array of isolate numbers. The specialised use of the species of digits in an array has resulted in the formation of zones in an array. Ranganathan and others belonging to the Indian School of thought, have fully utilised the potentiality of this concept.

The following five zones have been recognized in an array, under the condition that only singlets, doublets and triplets are allowed to be used:

Number of Zone	Range of Zone	Symbol used to represent
1.	Range of isolate numbers having a Roman small prefixed to it.	(Z-a)
2.	Range.....having a 0 (zero) prefixed to it	(Z - 0)
3.	Range.....having an Indo-Arabic number other than 0 (zero) prefixed to it.	(Z - 1)
4.	Range.....having a Roman Capital prefixed to it.	(Z - A)
5.	Range.....having (starter) prefixed to it. This range is used in isolate numbers placed between starter and arrester.	(Z-(....))

v) **Emptying Digits**

Emptying digit is a digit with its usual ordinal value and also semantic value, and further having the power to deprive the preceeding rich digit of its power of representing an idea. In other words, it deprives the semantic value of the preceding digit but allowing it to retain its ordinal value.

In CC, each of the digits T, U, V, W, X, Y, and Z is postulated to be emptying digits.

Example : In CC.K. represents the Basic class (idea) Zoology, with the addition of X (the emptying digit) to K we derive KX. Now K no more represents the (BC) Zoology, together, KX represent Animal Husbandry but here, K retains its its ordinal value therefore it precedes the letter L.

Thus, the sequence would be as follows:

K	Zoolozy
KX	Animal Husbandry
L	Medicine

Similarly, in the schedule of Space isolates 44 represents India. 44T represents Nepal 44X Pakistan etc. The "Emptying Digit Device" is used to achieve interpolation in an Array.

Self-Check Exercise - 2

State the necessity of developing various kinds of notation.

Note : i) Write your answer in the space provided below.

ii) Compare your answer with the model answer given at the end of this unit.

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10.6 FUNCTIONS OF NOTATION

The function of Notation depends on the type of notation. For instance the function of an emptying digit is to facilitate interpolation in array, that of an hierarchical notation is to indicate hierarchy among classes. However, when the functions of notation in general are considered, we find the following functions of notation which are enumerated by J. Mills :

1. The vital function is to mechanically maintain the sequence of subjects, by giving each term a symbol possessing an agreed ordinal value. This is seen when it is used on the backs of books to maintain shelf order, or on entries in catalogues and bibliographices to allow a classified order of subjects to be maintained. In other words, it helps to achieve mechanical arrangement of documents. Notation is primarily an ordering device.

2. makes the Alphabetical Subject Index possible. Because reference from a term in the Index (e.g. India: Education) could not in itself convey to a user the exact location of a subject. Whereas a class number cited alongside the term (e.g., India: Education as T.44) locates automatically. In other words it helps to mechanise the retrieval of documents from the shelves.

3. By the use of synthesis, or number-building, it makes possible enormous economies in the construction and physical size of the schedules.

4. It may provide mnemonic qualities which assist the librarian (and also, to a minor degree perhaps the reader) to remember the sequence of divisions within a class. It is because of (a) an underlying consistent order due to the repetition of the same sequence of sub-classes under different subjects which is implicit in a faceted scheme; (b) notation, which may reflect this consistent order eg. 423, 433, 443 in all these classes 3 stands for dictionary.
5. It assists the guiding of a library.
6. In lending libraries, it may be used as a charging symbol which keeps the issue in a helpful order and one from which figures of issues under a class can be easily obtained.
7. It reflects the subordination and coordination of the subjects and possible other inter-relations among the subjects.

Self-Check Exercise - 3

State the function of notation.

Note: i) Write your answer in the space provided below.

ii) Compare your answer with the model anser given at the end of this unit.

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10.7 QUALITIES OF NOTATION

As we have seen a number of sets and types of notation available to the designer of a scheme of classification who is known as classificationist. A number of tests can be used for the selection of symbols. The tests can also be called qualities of notation. A good notation must satisfy all the qualities. In practice it must be able to satisfy the majority of the qualities to a greater degree. The qualities are : (1) Simplicity, (2) Brevity, (3) Synthesis, (4) Expressiveness, (5) Mnemonic Value, (6) Flexibility, and (7) Hospitality. These qualities are briefly discussed below.

10.7.1 Simplicity

The notation should be simple which means it should be easy to say, read, write or type and also remember. Since, the notation is written in several places, such as, catalogue entries, various parts of the document, entries in biblographies, stock records, shelf list cards, etc., we must be able to write or type the number with ease. Use of unpopular and complicated symbols is not desirable as it will be difficult to read, write and remember those symbols. Further, polylithic multipart numbers or numbers with spacing is preferrable as they facilitate ease of reading

Eg. 7956893458 is more combersome than 795. 689 3458.

10.7.2 Brevity

Brevity stands for briefness. The notation should be brief. In other words, it should be as short as possible. A brief notation helps the user to grasp it easily and the library staff to enter it in various records with speed and economy. The briefness of the notation depends on two factors : 1) the base of notation, and 2) the apportionment or allocation of the symbols. For instance, compared to Indo-Arabic numberals the base of Roman alphabets A-Z is large. And

a mixed base of Indo-Arabic numerals, Roman caps and smalls is further more large. The larger the base the shorter the notation / class number. This is evident from the class numbers in D.C. and C.C. Example.

DC Class No.	Subject/Class	C.C. Class No.
581	Botany	I
581.03	Encyclopedia of Botany	Ik

The second factor affecting the brevity of notation is the distribution of the symbols among the subjects. The allocation of symbols among the subjects should be on the basis of their growth. For example : instead of assigning 303 for Encyclopedia of Social Science the same can be assigned for a subdivision of sociology and 300.3 could be used for Encyclopedia of Social Science under which class/heading there may be very few documents. Thus, since, 302, 303... 308 were used for standard subdivisions in Social Sciences upto 16th ed. of D.C.

The subdivision of Sociology had to be given lengthier numbers such as 301.1 Social psychology; 301.2 Culture and cultureal processes; 301.3 Ecology and community; 301.4 Social structure. Now in 20th edition of D.C. we find 302 for Social psychology; 303 for Social process; 304 for Factors affecting social behaviour (i.e. Ecology and community); 305 for Social groups, etc. In similar fashion, classes which are dynamic and have a high rate of growth may have to be assigned a briefer number so that the subdivisions of these subjects need not be represented by lengthier number.

10.7.3 Synthesis

By synthesis we mean that feature of notation of which it facilitates number building by taking the components from different parts of the schedule. Faceted notation, retroactive notation and mixed base, addition device etc. have the qualities of synthesis.

10.7.4 Expressiveness

This stands for the degree to which the notation reflects in its allocation the subordination, coordination and inter-relation among the subjects. This is usually represented by the length of the number and particularly the inter-relation is represented by relation signs. Usually coordinate classes should have the numbers of the same length and the numbers of the subordinate classes will be co-extensive with the length or intension of the class. Decimal fraction notation, faceted notation are some of the examples for expressive notation. The advantage of expressive notation is that it assists the user in following the structure of notation / classes. The drawback in this is the numbers would be usually long because of co-extensiveness.

10.7.5 Mnemonic Value

One of the important features is that a notation should possess memory value or in other words the mnemonic value. This can be ensured by using certain symbols to represent the specified ideals/topics throughout the schedules. Examples in D.C. standard subdivisions 01, 03, 05, 09, etc. stand for philosophy and theory, encyclopedia/dictionary, periodicals, historical and geographical treatment respectively throughout the schedules. Ranganathan incorporated four kinds of mnemonics in colon classification. They are (1) Alphabetical mnemonics, (2) Scheduled mnemonics, (3) Systematic mnemonics, and (4) Seminal mnemonics. These are very potential in enriching the memory of both the classifiers and the users. (For detailed discussion on Mnemonics see Unit 11).

10.7.6 Flebibility

This feature applies to faceted notation. CC upto 3rd edition was a rigidly faceted scheme and so had a rigid notation whereas from the 4th edition it has adopted flexibility by the virtue of use of more than one indicator digit. Further, J. Mills states that when the numbers are

reserved for alternative locations there should not be much effect on the length of the number. Flexibility also refers to hospitality of the notation.

10.7.7 Hospitality

Hospitality is perhaps the most important of all the qualities of notation.

This quality is also known as 'flexibility'. Knowledge is growing. Therefore, the schemes of classification should grow with it. In designing any scheme of classification, the classificationist takes into account the existing knowledge. But this is not the end of it. Another more important difficult task that lies before him is that by choosing versatile notational techniques the scheme should provide them in the correct places. Knowledge grows in several directions. New subjects appearing as coordinate to the existing subjects, i.e., as new divisions in the array. The other way is that a new division developing as sub-division of the existing subject in chain. The classification should take care of both. While most of the schemes have dealt with it partially, the credit of providing a satisfactory solution to this problem goes to the CC.

Self-Check Exercise - 4

State the qualities of notation.

Note: i) Write your answer in the space provided below.

ii) Compare your answer with the model answer given at the end of this unit.

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10.8 DEVELOPMENT OF NOTATION SINCE 1876

Till the middle of the 19th century continuous integers were used to represent subjects. The reason might be less amount of literary output and so library classification was not much of a problem. A time came when such a system broke down. Thus, the gap notation was adopted. It was Melvil Dewey who made a systematic attempt, for the first time, to develop an effective notation. It was in 1876 he used integers, consisting of pure notation of Indo-Arabic numerals applying the concept of decimal fraction notation in his **Dewey Decimal Classification**. The use of Decimal Fraction Notation led to an increase in hospitality in chain. He also introduced the "others device" to achieve hospitality in array. A dot (.) was used for the sake of convenience of reading or relieving the eye.

C.A. Cutter used Roman capitals for main classes, providing a longer base in his **Expansive classification** which was developed in seven stages (i.e., seven expansions). It was first published with an index in 1893. Further, it was mixed notation which was used by Cutter. He used Roman smalls in later arrays and Arabic numerals for common isolates. He extended the concept of Decimal fraction notation to the mixed notation. He used dot (.) as an indicator digit for common isolates.

The first attempt to design a new classification scheme in Britain was made by J.D. Brown. He brought out **Adjustable Classification** in 1897. This scheme had provision for future classes by way of gaps in the schedules. Later he replaced it by **Subject Classification** which took its final shape in 1906. Its base consist of Roman caps, though, it also uses Roman smalls and Arabic numerals. It provides an auxiliary schedule, called the 'Categorical table', which is an important feature of this scheme. For synthesising categorical table numbers it uses the dot (.) as an indicator digit. Eg., 1750 Leather; 1750.1 Bibliography on Leather. (Here .1 is

the constant categorical table number for bibliography). But the major shortcoming of the scheme is its poor apportionment of the symbols.

Since 1899, the year in which UDC started appearing in parts (however, the first complete edition came out in French in 1905) faceted notation came into picutre. The scheme was developed by FID and the persons responsible for founding the Institute were two Belgians, Paul Otlet and Henri La Fantaine. UDC uses mixed notation, though its base is the same as that of DDC. It is an almost faceted classification, providing facet and phase analysis. It uses indicator digits, for several auxiliary tables. They are : + / : ( ) : : = (0 ...) (1/9) (= .....) "...." . 00 . 0 for the synthesis of facets and phases. It has also adopted the sectorizing device, and is a great advance over DDC.

Another important classification which was originally designed for the internal use of the Library of Congress is the **Library of Congress Classification.** The LC schedules were issued from 1901 onwards. Its base consists of Roman capitals, and Arabic numerals are used for later divisions. It uses rigid integral notation, with plenty of gaps. It does not apply the concept of decimal fraction notation to its notation. The dot (.) has been used as an indicator digit. Further, Main classes are denoted by capital letters and in most of them a second capital is used to denote the major sections: Eg. Q Science, QD Chemistry. The subdivision of the class are denoted by Arabic numerals used as integers from 1 to 9999, if necessary. Alphabetical device is used frequently.

An American attempt to design a scheme of classification based on sound theory resulted in the **Bibliographic Classification** of Henry Evelyn Bliss. The first edition of BC appeared in its complete version between 1940 and 1953, and its second edition planned in 20 volumes, started appearing in 1977.

BC1 is largely a non-hierarchical scheme, using mixed notation of decimal fraction nature. Besides the use of Roman caps, Roman smalls, nine Arabic numerals (excluding '0' zero). The starter, dot, apostrophe, comma, and hyphen were used as indicator digits. The indicator digits (& and %) were introduced in the final volume of BC1, and were used very rarely, and later withdrawn. Bliss contributed retroactive notation through his BC2. BC2 uses digits 2, 3, 4, 5, 6, 7, 8 and 9 as indicator digits.

The credit for making the first attempt to design a scheme on entirely new lines and use of various types of notation goes to Dr. S.R. Ranganathan. He employed, in his **Colon Classification** various species of digits such as Roman Capitals, and Smalls, Indo - Arabic numerals, Greek letters, punctuation marks and various notational devices. The first edition of CC appeared in 1933 and till its third edition the scheme employed rigidly faceted notation. CC1 used the mixed notation with its base consisting of Roman capitals and subdivisions were represented by Arabic numerals. Roman smalls with anteriorizing values were used for approach materials. CC used the octave notation and the decimal fraction notation, i.e., isolates in array of order 1, after the first eight isolates, were generally represented by means of digit pairs, beginning with digit 9 in most cases.

Number Building process also employed various devices, such as, geographical device, chronological device, favoured category device, classic device, alphabetical device, etc. For facet analysis and indication colon (:) was used and zero (0) was employed for phase analysis. Since CC2 (1939) delta has been used to represent the main class Spiritual Experience and Mysticism. The hyphen (-) was adopted for super - imposition of isolates. From 4th ed. of CC (1952) different indicator digits, , ; : . were employed for five fundamental categories. The dot (.) was used for both space and time facets. Besides, backward arrow ($\leftarrow$) and forward arrow ($\rightarrow$) were also introduced. Further Greek symbols λ for Animal Husbandry and β τ μ ν Σ are used for agglomerate basic subjects.

In 1953 D.B. Krishna Rao suggested the concept of zones. In 1955 Vickery suggested packets for subject device. In 1957 allocation of zones for different kinds of isolates took place. Starter "("and arrester")" were adopted to avoid homonyms in the application of the subject device. Eta (η) was used for Mining. In 1960 and 1963 Greek letters λ and η and β (for Mathematical science) τ (for Physical science) are replaced by KX, HX, AZ and BZ respectively. $\Sigma$was left unchanged. It was in 1963 inverted comma (') was suggested as an indicator digit for Time facet. And the concept of "Emptying digit" was postulated in 1967. T,V, and X were postulated as emptying digits and U, W and Y as empty - emptying digits for interpolation in an array.

In CC7 equal to sign (=) was used as an indicator digit for abbreviation of the component words for a multi-nominal term for use in alphabetical device. The ampersand (&) replaced zero (0) as phase relation connecting symbol. The upward arrow ($\uparrow$) was postulated as an indicator digit for anteriorizing common isolate.

The latest general library classification to appear in the present century was Rider's **International Classification** in 1961. One would expect his scheme to be an improvement over the earlier schemes, but actually it was only an enumerative scheme with no devices allowing hospitality and details.

A new era began in the history of classification research with the establishment of Classification Research Group, London in 1950. The group has carried out research in the designing of special schemes using faceted principles. Now the researchers in classification are concerned with the question of how best classification can be adopted to the computer to produce better result.

10.9 SUMMING UP

Notation is a set of ordinal numbers used to mechanise the arrangement of documents and also represent the classes and their sub-divisions. Notation is essential not only for mechanising the arrangement of documents, but also to derive a helpful sequence of the documents, which cannot be derived by an alphabetical order or any other order. It facilitates collocation of documents by indicating the sub-ordination, coordination and other relations among the classes. In order to achieve this many classification theorists developed various kinds of notation to meet the requirements of library classification. A good notational system is supposed to possess the qualities such as simplicity, brevity, synthesis, expressiveness, mnemonic value, flexibility and hospitality.

10.10 MODEL ANSWERS

1. Ordinal numbers are those numbers which represent the place value of a thing in series, or in other words, the sequential value. Whereas, the cardinal numbers represent the quantitative value. Therefore, it is the ordinal numbers which are used for classification of books in the libraries in order to represent the location of a book in the sequence of books on the shelves.

2. The purpose behind use of notation is not merely to mechanise the arrangement of documents. Besides, the notation has to be expressive by indicating subordination, coordination and inter-relation between and / or among classes. And also provide hospitality to newer classes. In order to meet these requirements there is a need to develop various kinds of notation.

3. The functions of the notation are to :

    1. Mechanise the arrangement of documents.
    2. Make the Alphabetical Subject Index possible.

3. By the use of synthesis ensure economy in the construction and physical size of the schedules.
4. Increase the range of specification.
5. Aid the memory of both library staff and users.
6. Assist and guiding of a library.
7. Assist in circulation activity.
8. Indicate the relations among classes.

4. A good notation has to posses (at least) one or more of the following qualities:
   a) Simplicity
   b) Brevity
   c) Synthesis
   d) Expressiveness
   e) Mnemonic Value
   f) Flexibility
   g) Hospitality

10.11 ASSIGNMENTS

1) Define notation and discuss the functions and qualities of notation.
2) Write a comparative account of pure and mixed notation.
3) "Ever growing universe of knowledge demands versatile notation". Discuss.
4) State the need for notation in library classification.

10.12 RECOMMENDED BOOKS

Krishan Kumar. *Theory of Classification.* New Delhi : Vikas Publishing House 1983. (Ch.9)

Maltby, Arthur, *Sayer's Manual of Classification for Libraries.* 5th ed. London : Andre Deutsch, 1978 (Ch.5)

Mills, J.A. *Modern Outline of Library Classification.* Bombay : Asia Publishing House, 1962. (Ch.5)

Palmer, B.I. and Wells, A.J. *Fundamentals of Library Classification.* London: Allen and Unwin, 1961. (Ch.VI)

Ranganathan, S.R. *Prolegomena to Library Classification.* 3rd ed. Bombay : Asia Publishing House, 1967 (Reprint by Bangalore: UBS Publishers, 1990). (pt.H)

Sayers, W.C.B. *An introduction to Library Classification.* London: Grafton, 1954 (Ch.V)

10.13 GLOSSARY

Notation : A system of symbols generally letters and numerals, used separately or in combination, to represent the divisions of a classification system.

Pure Notation : In Classification, a notation which uses only one type symbol.

Mixed Notation : In Classification, a notation system which uses more than one type of symbol, such as mixture of letters and numerals.

Decimal Fraction Notation : In the Decimal Fraction Notation the place value of each digit in the host under remains unchanged byadding an extra digit at its right end. This concept also applied to mixed base.

Group Notation : A notation using two or more digits decimally, to represent coordinate classes and thereby increase its expressiveness.

Sector Notation : In Classifcation, a notation which reserves the final digit of a set (such as a 9 or Z) as a repeater to extend the representation of coordinate classes and thereby increased its expressiveness.
Originally called as octave device and also known as a sectorising device.

Non-faceted Notation : Notation with all the digits written closely so as to form one block. It is an alternative name for Unipartite Notation.

Zones : The concept of Zones is derived from concept of sectors. Zones indicate various groups of sectors.

10.14 MODEL EXAMINATION QUESTIONS

I. ESSAY QUESTIONS

1) Define notation. Explain briefly different types of notation used in Library Classification

2) Explain the functions and qualities of notation.

II. SHORT NOTES

a) Mixed notation

b) Emptying Digits.

UNIT - 11 : DEVICES AND MNEMONICS

Contents

11.0 AIMS AND OBJECTIVES

This Unit aims at explaining various Devices and Mnemonics used in the classificatory process. After studying this Unit, you should be able to :

- explain the meaning and importance of various Devices
- use various Devices to coin a class number with greater consistency
- describe the Mnemonics which form an important part in library classification
- discuss the importance and use of Mnemonics

11.1 INTRODUCTION

Knowledge is ever-growing complex entity. It has multi-dimensional growth. Enumerating all the units of knowledge exhaustively, in classification schemes, is almost a myth. Whereas, the purpose of a library classification scheme is to provide numbers for almost all units of knowledge, whether they are the broad subject divisions and or minute subject divisions.

In order to be compatible with the vast and infinite body of (universe of) knowledge, a classification scheme needs to employ certain devices with the help of which a classifier will be able to coin class numbers for most of the subjects. Therefore, the Devices can act as aids or tools which enable a classifier to form/coin coextensive class numbers, sharpen an existing focus and thereby form foci in a facet and accommodate new subjects whenever warranted. Even enumerative schemes of classification such as D.C. use synthetic principles (by providing schedules of common divisions i.e. Standard Subdivisions; Areas; Race, Ethnic and National Groups etc.). Synthesis of a class number or part of a class number is done by adding standard subdivision number to a base number by 'Add to' instruction.

The use of Mnemonics is highly desirable in library classification schemes. It is of great value to a classifier, a classificationist as well as a reference librarian and the users. Besides aiding memory, the use of Mnemonics facilitates us in reducing the size of the schedules, achieving parallel and consistent sequence of classes and finally, ensuring helpful sequence of the classes. Mnemonics provides autonomy to the classifer.

11.2 DEVICES - PURPOSE AND ADVANTAGES

11.2.1 Purpose of Devices

The primary purpose of the use of the Devices is to form or sharpen (i) foci of a facet in an analytico-synthetic scheme of classification, (ii) a class number in an enumerative classification and (iii) provide hospitality in array and chain (i.e. to accommodate newly emerging subjects).

Sharpening of the focus can be meant as extension or amplification of a focus, for example, if 'Professional ethics' is the focus which is enumerated in the scheme along with its focal number / isolate number, for coining number for 'medical ethics', which is not enumerated in the scheme, the extension of the focus or focal number of the focus 'professional ethics' could prove to be one of the best solutions, but this could only be done with the help of a suitable device, which involves addition of the number of the profession to the basic focal number (i.e the number of the professional ethics). In this fashion, when we coin a number as and when it is required it is called sharpening of the focus. The process of sharpening of the focus to form numbers for more than one focus, results in forming the foci of a facet.

Sharpening of focus Example (from CC6) :

Class / Focus	**Class No.**
Professional ethics	R44 Focal number for "Professional ethics" The Basic class number "Ethics"

Medical Ethics (i.e. ethics of the Medical Profession for which the scheme does not have a ready made number)

Class/Focus	**Class No.**
By 'amplification of the focus by the use of (SD) a classifier can coin number for such a focus	R44(L)
Forming foci in a facet	
When the above process is used to enumerate the foci of various professional ethics it results in forming the foci in a facet.	R 44(2) Ethics for Librarians R44(L) Medical ethics R44(T) Educational ethics R44(W) Political ethics, etc.

11.2.2 Advantages

The advantages of using the Devices are:

(i) Enumeration can be avoided to a greater extent. This leads to the reduction in the size of the schedules, thereby Law of Parsimony can be satisfied.

(ii) The classifiers can be provided with autonomy. For those classes for which numbers are not provided in the scheme, the classifer will be in a position to form numbers for even such classes. Further, the Devices facilitate number building for new subjects too.

(iii) By the virtue of the Devices, we can satisfy the canons of consistent sequence, helpful sequence, scheduled mnemonics and hospitality in array as well as chain.

(iv) To a greater extent, when the Devices are correctly employed, they give rise to uniform numbers irrespective of who the classifier might be.

Self-Check Execise - 1

(a) What are the advantages of the use of Devices?

Note : i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this unit.

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(b) Name the principles and canons which can be satisfied by the use of Devices.

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11.3 VARIETY OF DEVICES

Every classification scheme employs Devices, even the enumerative schemes too employ the Devices such as 'Decimal Fraction Device', 'Enumeration Device', 'Gap Device' and other synthetic Devices. But, it is Dr. S.R. Ranganathan and the Indian School of Thought who contributed much to the development of various devices. In order to develop and improve the capabilities of a classification scheme a variety of devices are introduced. The following are some of the devices used in different schemes of classification.

i) Agglomeration Device

ii) Alphabetical Device

iii) Chronological Device

iv) Classic Device

v) Common Isolate Device

vi) Decimal Fraction Device

vii) Empty - Emptying digit Device

viii) Empty Digit Device

ix) Enumeration Device

x) Environmental Device

xi) Facet Device

xii) Gap Device

xiii) Geographical Device

xiv) Group Notational Device

xv) Mixed Base Device

xvi) New Digit Device

xvii) Numerical Device

xviii) Phase Device

xix) Scheduled Mnemonic Device

xx) Sector Device

xxi) Speciator Device

xxii) Subject Device

xxiii) Superimposition Device

In addition to the above, we may also mention the extension notation and stroke notation devices.

In this Unit we will learn about the devices which are not discussed in other Units. For instance, the Decimal fraction device, empty-emptying digit device, empty digit device, facet device, group notation device, mixed base device, sector device, etc. are discussed in Unit - 10, the Mnemonic devices are discussed in Unit - 11, similarly few others were dealt in other units.

11.3.1 Agglomeration Device

The Agglomeration Device is devised to represent cluster of classes. Two kinds of agglomerates of basic subjects have been recognised, namely, the Agglomerate of Kind 1 and the Agglomerate of Kind 2.

(a) **Agglomerate of Kind 1 :** It was referred to, earlier, as partial comprehension. It is a comprehension of successive (i.e. occuring consecutively) primary basic subjects enumerated in the scheme.

CC uses agglomeration device by employing "Z" as an emptying digit and asterisk (*), an anteriorizing digit as the connecting symbol. An agglomerate class is treated as a coordinate class along with the basic subjects falling in its cluster. Therefore, this approach involves telescoping in array. It is in CC7 this device is widely used.

Examples:

1. Agglomeration of Basic subjects
   B*Z Methematical & Physical Sciences
   E*Z Chemical Sciences
   G*Z Biological Sciences

2. Agglomeration of foci in a facet from schedule of Medicine :
   17*Z Head and neck
   17 Neck
   18 Head
   181 Face
   182 * Z Sense organs
   183 Ear

(b) **Agglomerate of Kind 2 :** Stands for aggregates, consisting of two or more topics / subjects, usually, those which are non - consecutive and not catered for by the grouping in the scheme.

Eg. : Society and Technology

For such classes UDC has provision to represent agglomerates of Kind 2. The "Plus" sign (+) is used for this purpose. The above classes get 301+6 and 51+54 respectively. Whereas in case of CC the numbers for such classes may have to be coined by phase (relation) device only.

11.3.2 Alphabetical Device (AD)

It is one of the important devices in sharpening a focus and forming a foci. The details of this device are presented in the section 11.4.1. Alphabetical Mnemonics.

11.3.3 Chronologcial Device (CD)

When a focus can be sharpened on the basis of the chronological characteristics i.e., by epoch of origin or birth or first investigation on or discovery or initiation or occurence or any other epoch, by the use of the chronological number we may sharpen the focus.

DDC and UDC do not use the chronological device, whereas CC uses it quite often.

Eg : from CC6

A specific scheme of classification should be individualised by (CD)

2:51M	Decimal
2:51M9	Expansive
2:51M96	Universal Decimal
2:51N	Congress
2:51N3	Colon

Systems in Medicine by (CD)

LB	Ayurveda
LC	Siddha
LD	Unani
LL	Homoeopathy
LM	Naturopathy

In the similar fashion to sharpen a focus or form foci in a facet CD is used in Mathematics, Physics, Religion, Psychology, Literature, Fine Arts, Education, Economics etc.

11.3.4 Classic Device (CD)

A book stimulating other books and literature on itself is a classic. Classics are not peculiar to the main classes 'Religion' and "Literature'. Other main classes have classics of their own. In order to give a special treatment to classics and collocate literature on a classic (particularly for bringing together the different editions of a classic in a class, the different editions of each of its commentaries and sub-commentaries and so on), the device which is employed is called Classic Device.

It is CC which employed this device. At the notational plane the device involves the successive addition of the following to the ultimate class number:

a) The digit x

b) The author facet; and

c) Work facet

The above is not applicable to sacred-work or a work beloging to basic class Literature (except Sanskrit, Telugu, Tamil), as these are individualised otherwise. Further, there are detailed rules which may have to be followed for constructing a number for a classic. In CC6 Ranganthan provided a separate schedule of classics and sacred books with special names and their class numbers in Part - 3.

Example : from CC6 (Part - 3)

LB:4:7x2,I	Susruta - Samhita
LB:4:7x2,1,1	Chakra-Pani -- datta : Bhanu-mati
LB:4:7x2,1,5	Madhava's commentary

(Both second and third items are commentaries of Susruta - Samhita). Here, under the author facet the author number is given by Favoured-Category Principle.

P35,ExM60,1	Chinnaya Suri (Paravastu) : Bala --Vyakaranam
P35,ExM60,1,1	Sankara Rangayya and Venkata Rama Sastri (Kalluri) : Bala -- Vyakarana -- Guptarthaprakasika

Here, author number is given by (CD).

11.3.5 Enumeration Device

The Enumeration Device is the most widely used device in all the schemes for classification. Even where Chronological Device or Geographical Device or Subject Device is used, each of them presupposes the Enumeration Device. But the only difference between Enumerative Schemes and Faceted/Analytico-synthetic schemes of classification is that in the case of Enumerative Schemes the classes and their subdivisions are enumerated along with their respective class numbers. In the case of Analytico-synthetic scheme, instead of enumeration of classes and their divisions we find enumeration of basic classes and enumeration of (special) isolates under the basic classes and common isolates in separate schedules.

11.3.6 Environmental Device

By attaching the speciator (S) (i.e., the idea or idea -- complex used or intended to be used as a qualifier), to basic subject Medicine, compound subjects are formed with environmental divisions. In this case, the environmental division is used as the speciator, to the host basic subject or a host isolate idea. We may form classes for the extra -- normal environment of the study. Thus, the device used in the process of deriving environmental divisions of a study is called Environmental Device.

For example : Medicine is divided by environmental divisions such as tropical, polar, aviation etc.

Eg: From CC7

L-9U3	Tropical medicine
L-9U8	Polar medicine
L-9UD7	Aviation medicine

The use of 'hyphen' (-) as indicator digit for speciator is in vogue from 7th edition of CC. Earlier (-) was used for superimposition.

11.3.7 Geographical Device (GD)

This device involves the use of appropriate geographical characteristic (that is, continent, country, state, district, etc. as the case may be) for the formation or the subdivision of an isolate.

Eg: R8 Other systems (of philosophy by (GD)

This focus can be amplified by GD to coin numbers for philosophical systems of various areas.

Eg.	R85	European philosophy
	R86	African philosophy
	R873	American philosophy etc.
	Q8	Other Religions
	Q84313	Caodaism (The religion of Vietnamese)

In the similar manner, there are many areas such as History, Law, Sociology, Psychology, etc. where GD is used to sharpen a focus or form foci in a facet. The (GD) automatically ensures conformity to the canons of consistent sequence, helpful sequence, mnemonics and hospitality in array and chain.

11.3.8 Superimpsoition Device (SID)

When an isolate is not scheduled in a facet but can be regarded as a compound / complex isolate consisting of more than one scheduled isolate such an isolate is called a *Superimposed Isolate.* The device used to coin number for such isolates is called the "Sumperimposition Device". The connecting symbol used for superimposition is "-" (hyphen) in CC6.

Eg : In the entity facet (i.e., the [P] facet) of S Psychology, 21 is boy, 61 is genius and the isolate "Genius boy" is not scheduled. The number for this isolate can be got by (SID). 21-61 would stand for 'Genius boy'.

With the introduction of the concept of speciator in CC7 the use of the concept of superimposition and the device is discontinued.

11.3.9 Speciator Device

Two kinds of speciators were recognised in CC7. They are :

Speciator Kind - 1: Any recognized isolate idea or a subject may be speciator for another isolate idea.

Example :

Africians

By Standard of living

Lower class

Upper class

Middle class

In the above example the class is the speciator.

Speciator Kind 2: An idea which is not by itself an isolate idea or a subject but can be used as a speciator, going with a host isolate idea or its sub-division.

Example :

India

By orientation

North

South

East

West

In the above example the divisions under orientation are considered as ideas which by themselves cannot be considered as isolate ideas or subjects.

The speciator device is used to construct numbers for such classes which were listed above. The speciator device uses the 'hyphen' (-) for connecting a speciator of Kind 1; and the 'equal to sign' (=) for connecting a speciator of Kind 2.

11.3.10 Subject Device (SD)

For formation of an isolate or subdivisions of an isolate or sharpening a focus this Device is used. Whenever the class characteristic (i.e. other subject or subject division) forms an appropriate means, the use of class characteristic is preferred and the device used in this connection is called the Subject Device.

The formation of an isolate or the subdivisions of an isolate also means amplification or sharpening of a focus and forming foci in a facet. In particular the (SD) may be used, whenever warranted, to form the foci or extend the schedule in any [E] facet. In such a case the (SD) Isolate Idea must be more abstract than the Basic class. The subject Device Number (SDN) should be enclosed within circular brackets.

The following examples illustrate how the (SD) is used to amplify a focus and thereby form foci and in particular the formation of foci or extend the schedule in any [E] facet.

(1) Amplification of a focus and to form foci by (SD)

T9	Education for other classes (to be divided by (SD))
T9(Y31)	Rural Community
T9(Y4)	Vocation
T9(Y52)	Aristocracy
T:3(2)	Teaching Library Science
X8(A)	Industry
X8(F182)	Iron Industry
X8(M7)	Textile Industry

(2) To form the foci in any [E] facet:

J:(D)	Agricultural Engineering
J:(E)	Agricultural Chemistry
J:(E:3)	Agricultural analysis
J:1:(G91)	Soil Microbiology
F:(G)	Biotechnology
G:(C)	Biophysics

When the (SDN) is used as an Energy isolate number it has to be connected with the (:) colon which is a connecting symbol for Energy isolate numbers.

Self-Check Exercise - 2

Name the five devices which represent the important characteristics which form the basis for the subdivision of an isolate.

Note: i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this unit.

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11.4 MNEMONICS

The word "Mnemonics" finds its origin in a Greek word meaning " to remember". Its dictionary meaning is "the art of assisting memory", "the process or technique of improving or developing the memory", etc. In other words mnemonics means " aid to memory". In day-to-day life every one of us uses and practices the use of mnemonics at one time or the other. When one goes to market, in order to mitigate the loss of memory regarding what he has to get from the market one may use mnemonics such as BATS where, B may stand for Biscuits, A for Apples, T for Turmeric and S for Salt. Sometimes, one may remember the name of a person by associating it with some object or quality.

Elucidating its benefits, Berwick Sayers remarks that "there is a very general quality in modern classification notations which is ingenious and, within limits, of great value to the classifier, This is its mnemonic quality; its power of assisting the memory and of reducing the work of reference to tables and indexes to the minimum. By mnemonic notation we mean a notation which has always the same significance whenever it appears in the classification".

In order to take optimum advantage of mnemonic notation, Ranganathan prescribed a general canon of mnemnocis. **The general canon of mnemonics** states "the digit or digit-group used to represent a specific concept in a class number (or any of its constituents) should be the same in all class numbers having that concept represented in them, provided that insistence on such consistent representation does not violate more important requirements".

Self-Check Exercise - 3

List the uses of mnemonics.

Note : i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this unit.

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Ranganathan identified the following four kinds of Mnemonics:

a) Alphabetical mnemonics,

b) Scheduled mnemonics,

c) Systematic mnemonics, and

d) Seminal mnemonics

11.4.1 Alphabetical Mnemonics

Alphabetical mnemonics are quite common in life. Because, they are the verbal mnemonics such as those mentioned earlier in this unit. Their application for the construction of a class number would be done by the use of the "Alphabetical Device".

Canon of Alphabetical Mnemonics: "Alphabetical mnemonics should be rejected without any hesitation, if a sequence more helpful to readers or more filiatory than alphabetical sequence exists. Alphabetical mnemonics should be preferred if the alphabetical sequence is all helpful as any other sequence and if an international nomenclature exists in the field to which it is applied" (*Prolegomena,* 1967).

This consists in representing an idea by the first letter or the first few letters in its name as per the need of individualisation. Because, in certain cases there may be names of two or more ideas/entities, occuring in the same array, bearing the same initial letter or letters. For instance, if the names of two or more ideas falling in the same array, begin with the same letter, then one of them is represented by the first letter, and the others by the first two letters in their respective names. If the names of two or more ideas begin with the same two letters, then one of them is represented by these two letters and the others by the first three letters in their respective names and so on. The construction of class numbers with the help of Alphabetical Mnemonics is easy.

The Alphabetical Device is not preferred as a matter of first choice. But sometimes the use of Alphabetical Device becomes necessary, because the arrangement of subjects on the basis of any characteristic is not helpful. This is used in the arrangement of "Brands" of bicycles or motor cars and of different strains of agricultural crops, names of persons, institutions, places/ geographical entities, and works of persons belonging to field of literature, etc. Further, it should be noted that the arrangement of different brands or strains or entities is in accordance with literature relating to the product/entity. The classification is concerned with the arrangement of literature but not the product or entity as such. The following examples illustrate the use of Alphabetical Mnemonics.

Examples :

There might be a vast amount of literature relating to the cultivation of different varieties of paddy. There are several varieties of paddy which may not be specified in the schedules. Usually, there will be one number available for paddy. So its varieties can be individualised with the help of alphabetical mnemonics.

Class no. for Rice (in CC6) : J381

The class number of specific variety may be amplified by (AD):

Basumati	J381B
Hamsa	J381H
Masoori	J381M
Sona Masoori	J381MS
Surekha	J381S
Suvarna	J381SU

The Alphabetical Device has some limitations. In view of the international applicability of a scheme of classification, the artificial numbers should be easily understood. For this reason vernacular languages cannot be used unless they are internationally recognised. In certain instances Alphabetical Device results in scatter among related subjects, for example, Masoori and Sona Masoori which are related may get scattered if their number is given as J381M and J381SM respecitvely.

Dewey Decimal Classification scheme also uses Alphabetical Mnemonics. Under political parties the scheme prescribes in the following manner :

Arrange as below, but, if desired, arrange specific parties of a specific country alphabetically, eg., Labour Party of United Kingdom 324.241L2

Under Class 800 Literature (Belles-Lettres)

If desired, subarrange works about and by Shakespeare according to the following table, which may be adapted for use with any specific author : (under this table O-Z stand for Individual works)

The class numbers for Shakespeare's *Hamlet* is 822.33S7-8 and for *The Tempest* 822.33Q5-6

Thus, Alphabetical Mnemonics/Device is usually prescribed by most of the schemes. L.C. Prescribes it more often than others. UDC uses it more sparingly. DC and CC use this device more sparingly.

Self-Check Exercise - 4

Write a very brief note on Alphabetical Mnemonics.

Note : i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this unit.

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11.4.2 Scheduled Mnemonics

An isolate idea which occurs in more than one class need not be enumerated under each or whatever class it may occur. Instead, enumeration can be done at one place or under one class and the same isolate idea/term/number can be used for all the relevant or related classes as per need. Thus enumerated isolates are called as Scheduled Mnemonics.

In other words, in order to avoid duplication of emumeration of classes or isolates Scheduled Mnemonics may be used. These mnemonics satsify the law of parsimony and also canon of consistent/parallel sequence.

Canon of Scheduled Mnemonics

"A scheme for classification should use one and the same digit or digit group, as the case may be, to represent an isolate idea or an array isolate idea, in whatever subject it may occur". (*Prolegomena,* 1967, p. 298)

For instance, "Absorption", "Metabolism", "Heredity", "Hybridisation", etc. are some of the isolate ideas which occur in the classes Biology, Botony and Zoology. Under each of these classes the digit/digit-group used for these isolate ideas must be same. This could be achieved by enumerating these isolates under Biology with their isolate numbers and the same could be used for all the other classes. This helps in avoiding duplication of enumeration.

In the above mentioned fashion scheduled mnemonics are used in the classification schemes. The following table presents the use of scheduled mnemonics in Colon Classification: CC makes use of parallel schedules through instructions such as the following:

Basic Class	Facet	Parallel Schedule
2	[M]	same as foci in [P] for Generalia Bibliography
I	[E] [2P]	As in "Biology"
K	[E] [2P]	As in "G Biology"

W	[P2] : [E] [2P]	Same as for "V History"
Y	(P)	6 Abnormal and defective *To be subdivided* as in "S Psychology"

Decimal Classification: In the DC the use of parallel schedules to satisfy the canon of scheduled mnemonics is secured by the instructions : "Divide like" or "Add to", found throughout the schedules:

Example :

(1) 181, 04 - .09	Oriental philosophy based on specific religions Add to base number 181.0 the numbers following 29 in 294 -- 299 e.g. Jewish philosophy 181.06
(2) 547.34	Qualitative Analysis Add to base number 547.34 the numbers following 544 in 544.01 - 544.98, e.g. microscopical analysis 547.3482.

Besides the above all common subdivisions, space and time divisions also form part of Scheduled Mnemonics, provided there is no duplication of their enumeration along with various subjects.

Self-Check Exercise - 5

Write a very brief note on Alphabetical mnemonics.

Note : i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this unit.

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11.4.3 Systematic Mnemonics

Systematic mnemonics ensure helpful sequence of classes / isolates in an array by aiding the classificationist while constructing the schedules of a classification scheme, by providing autonomy to the classifier. While coining class numbers for some of the isolates which are not enumerated in the scheme but can be assigned numbers on the basis of systematic mnemonics, in other words on the basis of principles of helpful sequence, and finally they aid the memory of the users at the time of document retrieval.

Conon of Systematic Mnemonics: "In a scheme for classification, the digits used to represent the array isolate ideas in an array should run parallel to the sequence in which the principles for helpful sequence would arrange the array isolate ideas". (*Prolegomena,* 1967; p. 301)

The canon of systematic mnemonics with the help of principle for helpful sequence leads to the following sequences:

1. Time sequence,
2. Evolutionary sequence,
3. Spatial sequence,
4. Quantity sequence,
5. Complexity sequence,
6. Traditional or cononical sequence,

7. Literary Warrant Sequence, and also
8. Alphabetical Sequence.

Few examples of the use of the principles in securing the systematic mnemonics are given below:

Time sequence : (Principle of Later-in-time)

Subject	Class No.	
	CC6	DDC19
Stratigraphy	H5	551.7
Archeozoic	H51	551.712
Primary	H52	551.72
Secondary	H53	551.76
Tertiary	H54	551.78
Quaternary	H55	551.79

Evolutionary Sequence:

Subject	Class No.	
	CC6	DDC19
Zoology	K	591
Protozoa	K2	593.1
Porifera	K3	593.4
Coelenterta	K4	593.5
Echinodermata	K5	593.9
Vermes	K6	595.1
Mollusca	K7	594
Arthropoda	K8	595.2
Prochordata	K91	596
Pisces	K92	597
Amphibia	K93	597.6
Reptiles	K94	597.9
Aves	K96	598
Mammalia	K97	599

Spatial Sequence :

Subject	Class No. CC 6	DDC 19
Botany	I	581
Root	I,13	581.498
Stem	I,14	581.495
Leaf	I,15	581.497
Flower	I,16	--
Fruit	I,17	--
Seed	I,178	--

In the above example DDC does not conform the principles of helpful sequence.

Quantity sequence :

Subject	Class No. CC 6	DDC 19
Town Planning	NB	711.4
Village	NB,1	711.43
Town	NB,3	711.43
City	NB,5	711.43
Metropolis	NB,7	711.43

In the above example also DDC does not follow the principles of helpful sequence. Whereas CC always tries to satisfy the principles of helpful sequence.

Complexity Sequence:

Subject	Class Number CC 6	DDC 19
Psychology	S	150
Perception	S:2	152.1
Consciousness	S:3	153
Cognition	S:4	153.4
Emotion	S:52	152.4
Conation	S:6	155.3
Personality	S:7	155.2
Metapsychology	S:8	154

Self-Check Exercise - 6

Write a very brief note on Systematic Mnemonics.

Note : i) Write your answer in the space given below:

ii) Compare your answer tith the model answer given at the end of this unit

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11.4.4 Seminal Mnemonics

Seminal Mnemonics deal with seminally equvalent concepts. They consist of using the same digit (s) to represent seminally equivalent concepts, irrespective of the basic class in which these might occur or the terminology used for them. Class numbers obtained with the help of seminal mnemonics digits will satisfy the canon of filiatory sequence, the canon of consistent sequence and the canon of helpful sequence.

Canon of Seminal Mnemonics

"A Scheme of classification should use one and the same digit to denote seminally equivalent concepts in whatever subject they may occur" (*Prolegomena,* p. 304)

Let us see the difference between Scheduled and Seminal Mnemonics. In Scheduled mnemonics, the same concept is represented by the same term and the same number, in all its places of occurence. For example, "2" one of the subdivisions of individual literatures in Table 3 in DC stands for "Drama", the same digit represents drama when it is used with the literature of every language as follows:

English	French	German
(Drama)	(Drama)	(Drama)
42<u>2</u>	44<u>2</u>	43<u>2</u>

The underlined 2 stands for drama in the literatures of the above languages.

On the other hand in Seminal mnemonics the same digit gains a new term in different subjects, but the terms will be seminally equivalent ones as the identity of the concepts is cognizable at great depths, beyond the reach of natural language. In CC for example 1 is a seminal mnemonic digit used as mnemonic for unity, God, world, the first in evolution or time, one dimension of line, solid state, and all other entities existential or conceptual, which may be viewed as correlates to the above. Therefore, the digit "1" is used for "Line" in Geometry, Basic and regional life" in Life Sciences, for "God" in Theology, for "Child" in Psychology, for "Head" in History, for "World" in Space isolates, etc.

Earlier, Ranganathan called this kind of mnemonics as unscheduleld mnemonics. Later, on the advice of Palmer and Wells the name was changed to Seminal Mnemonics. Following is the list of Seminal Mnemonics given in CC6.

The digit 1 is used as mnemonic for unity, God, world, the first in evolution or time, one dimension or line, solid state, and all other entities existential or conceptual which may be viewed as correlates to the above.

The digit 2 is used as mnemonic for two dimensions, plane, conics, form, structure, anatomy, morphology, source of knowledge, physiography, constitution, physical anthropology, and all other entities, existential or conceptual, which may be viewed as correlates to the *above.*

The digit 3 is used as mnenomic for three dimensions, space, cubics, analysis, function, physiology, syntax, method, social anthropology, and all other correlates to the above.

The digit 4 is used as mnemonics for heat, pathology, disease, transport, interlinking, synthesis, hybrid, salt, and all other entities, existential or conceptual, which may be viewed as correlates to the above.

The digit 5 is used as mnemonic for energy, light, radiation, organic, liquid, water ocean, foreign land, alien, external, environment, ecology, public controlled plan, emotion, foliage, aesthetics, woman, sex, crime and all other correlates to the above.

The digit 6 is used as mnemonic for dimensions, subtle, mysticism, money, finance, abnormal, phylogeny, evolution, and all other entities, existential or conceptual, which may be viewed as correlates to the above.

The digit 7 is used as mnemonic for personaltiy, ontogeny, integrated, holism, value, public finance, and all other correlates to the above.

The digit 8 is used as mnemonic for travel, organisation, fitness.

11.5 SUMMING UP

The devices are the aids or tools, in the classificatory process, which enable the classificationist to enhance the capabilities of his classification scheme and the classifier to coin coextensive class numbers and also accommodate newly emerging subjects. The purpose of the device is to form or sharpen (i) foci of a facet in an analytico - synthetic scheme of classification, (ii) a class number in an enumerative classification and (iii) provide hospitality in array and chain.

The use of the devices facilitates avoidance of enumeration to a greater extent, provision of autonomy to the classifier, and it also satisfies the law of parsimony and the canons of consistent sequence, helpful sequence, scheduled mnemonics and hospitality in array and chain. The number of the devices is proportionate to the number of complexities in the classificatory process, but usually it is the analytico - synthetic schemes, which may have to employ many devices. Dr. S.R. Ranganadhan and the Indian School of Thought contributed substantially to the development of various devices.

Some of the important devices are Alphabetical Device, Chronological device, Classic device, Gap device, Geographical device, Superimposition device or Speciator device, Subject device etc.

'Mnemonics plays a very vital role in library classification in achieving filiatory / helpful sequence, consistent and parallel sequence of subjects. They also satisfy the law of parsimony. They aid the classificationist at the time of constructing the schedules, the classifiers at the time of coining class numbers for the documents in the libraries and finally the users at the time of retrieval of documents.

There are four kinds of mnemonics. The Alphabetical mnemonics use Alphabetical device, the Scheduled mnemonics use Enumerative devices, the Systematic mnemonics use the principles of helpful sequence and the seminal mneonics are seminal and unique in nature and are propounded by Ranganadhan. All most all classification schemes use mnemonics and CC is the potential user of all the four kinds of mnemonics.

11.6 MODEL ANSWERS

1. (a) The advantages of using the Devices are:

* Avoidance of enumeration to greater extent and thereby satisfy law of parsimony.

* Provision of autonomy to the classifier to build coextensive class numbers.

* Satisfy the canons of consistent sequence, helpful sequence, scheduled mnemonics and hospitality in array and chain.

* When the devices are correctly employed there is a possibility of coining uniform numbers.

(b) With the use of the devices the following principles and canons can be satisfied

* Law of parsimony

* Canon of Consistent sequence

* Canons / Principles of helpful sequence and Scheduled mnemonics

* Canons for hospitality in array and hospitality in chain

2. * Alphabetical device

* Chronological device

* Superimposition device or Speciator device

* Subject device

3. Mnemonics is useful in library classification. They serve as aids to memory. They play a very vital role in library classification in achieving filiatory / helpful sequence, consistent and parallel sequence of subjects, in other words the documents, and they also satisfy the law of parsimony. Mnemonics aid the classificationist at the time of constructing the schedules, the classifiers at the time of coining class numbers for the documents in the libraries and finally the users at the time of retrieval of documents.

4. Alphabetical mnemonics involves the use of the first letter or the first few letters in the name of an idea or entity to form or sharpen a focus or focal number. They are usually used to coin numbers for different brands of a product or different strains of agricultural products, names of persons or institutions, places, etc. Unless and until the use of alphabetical device becomes necessary, the use of alphabetical mnemonics is not preferred. Alphabetical mnemonics have their own limitations with regard to international applicability and collection of related subjects.

5. Scheduled mnemonics deal with isolate ideas, which occur in more than one class. In order to avoid the duplication of their enumeration with every class scheduled mnemonics are used. They give rise to avoidance of duplication of enumeration, consistent/parallel sequence and finally they satisfy law of parsimony. Special subdivisions which are common to some of the related classes, common subdivisions, such as, space, time, form and other divisions form part of scheduled mnemonics.

6. Systematic mnemonics ensure helpful sequence of classes / isolates in an array by aiding the classificationist while constructing the schedules of a classification scheme. It als aids the classifier while coining class numbers for some of the isolates which are not enumerated in the scheme but can be assigned numbers on the basis of systematic mnemonics. In other words on the basis of principles of helpful sequence by providing autonomy to classifier and finally they aid the memory of the users at the time of document retrieval.

Systematic mnemonics conforms to the principles of helpful sequence and give rise to filiatory / helpful sequence.

11.7 ASSIGNMENTS

1) What are Devices ? Explain their need and usefulness in library classification.

2) Write a brief account on various devices used in library classification.

3) What are the devices through which hospitality in Array and Chain can be achieved? Cite examples from CC & DDC.

4. Define Mnemonics and discuss different kinds of Mnemonics.

5. Discuss the value of mnemonics in library classification.

6. Make comparative study of scheduled mnemonics as used in DC and CC.

11.8 RECOMMENDED BOOKS

Battacharya, G. "Classifying by UDC and CC : A comparativ study" DRTC Annual Seminar, 9; 1971. (Paper CB).

Krishnan Kumar. *Theory of Classification.* New Delhi : Vikas, 1985. (Ch.II)

Maltby, Arthur. *Sayer's manual of classification for librarians.* London: Andre Deutsch, 1960 (Ch 12.)

Mills, J.A. *Modern outline of library classification.* Bombay: Asia Publishing House, 1960 (Ch. 5).

Rahman, Abdul and Ranganathan, T. "Non-Seminal Mnemonics". *Annals of Library Science* V. 9, p.1-14.

Raju, A.A.N. *Decimal, Universal Decimal and Colon classification: A study in comparison.* Delhi : Ajantha, 1984.

Ranganathan, S.R. *Colon Classification.* Bombay : Asia Publishing House, 1960. (pl. 29-1.34).

Ranganathan, S.R. *Prolegomena to library classification.* Bombay: Asia Publishing House, 1967 (pt. N.)

11.9 GLOSSARY

Devices	:	In classification, Devices are the aids or tools which enable a classifier to form a coextensive class number, sharpen an existing focus and thereby form foci in a facet.
Mnemonics	:	Symbols of the notation of a classification. Mnemonics may be constant, i.e. always denoting the same aspects or form wherever used throughout a scheme of classification or variable i.e. occasionally altered to suit the special needs of a specific subject.
Chronological Device	:	It is a notational device which ensures chronological order by using a symbol to represent a date or origin.
Geographical Device	:	This device makes use of appropriate geographical characteristics such as Continent, Country, State, Districte tc. for the formation of an isolate.
Super-Imposition Device	:	This device is helpful when an isolate is not scheduled in a facet but can be regarded as a compound / complex isolate consisting of more than one scheduled isolate.
Seminal Mnemonics	:	Related ideas or association used by Ranganathan in classifying documents are called 'Unscheduled Mnemonics' or 'Seminal Mnemonics'.
Scheduled Mnemonics	:	When they are drawn from lists of divisions, tables or parts of schedules, they are called as 'Scheduled mnemonics'.
Systematic Mnemonics	:	Systematic Mnemonics are those reflect a consistent order; they are mainly a result or synthesis.

11.10 MODEL EXAMINATION QUESTIONS

I. ESSAY QUESTIONS

1) What do you understand by 'Devices'? Briefly, explain the various Devices used in library classification

2) What is 'Mnemonics'? Discuss the importance of Mnemonics in library classification.

II. SHORT NOTES

a) Subject Device

b) Seminal Mnemonics.

UNIT -12 : CALL NUMBER, BOOK NUMBER AND COLLECTION NUMBER

Contents

12.0 AIMS AND OBJECTIVES

This Unit introduces you to the final result of the library classificatiory process, that is, the call number and its constiuent parts, The Call Number consists the class number, the book number and the collection number.

After studying this unit, you should be able to :

- explain the call number and its constituent parts;
- discuss with various methods or tools used in coining a call number; and
- coin a call number for books in a library.

12.1 INTRODUCTION

Library classification groups the documents basing on their subject content. However, this is only a first step in classifying the documents which results in placing each document in the ultimate class to which it may belong. "Ultimate class of the subject of a book - that is, the class of the smallest extension, in the preferred scheme for classification, in which the book can be placed" (*Prolegomena :* 1967. p. 503).

In fact, the ultimate class of a document is the subject with an extension proportionate to the scope of the subject covered by the document. For example, the ultimate class of a book entitled, *Introduction to Medicine* is Medicine and that of *Elements of Physiology* is Physiology or in Medicine. The first step in classifying books results in assigning a class number (i.e., the number for the subject of the document) from a classification scheme, for instance, in case of

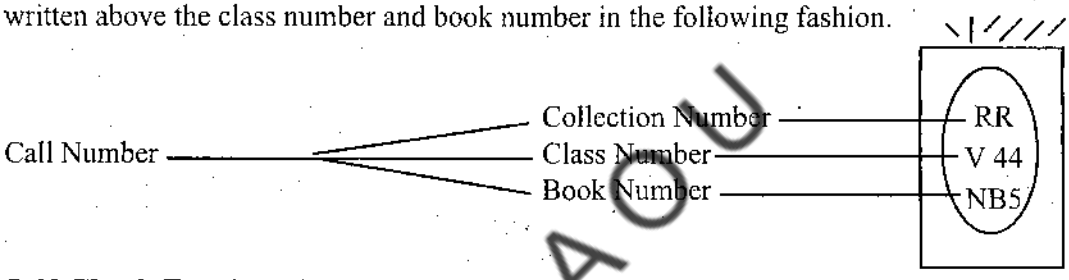
the above books, it will be L (for Medicine) and L:3 for (for Physiology) from CC 6. As such, there will be a number of documents in each ultimate class bearing the same class number.

Therefore, there would be a need to further individualise such documents. In view of this Dr. S.R. Ranganathan defined the process of library classification as "the translation of the name of the specific subject of a book into a preferred artificial language of ordinal numbers and the individualisation of the several books dealing with the same specific subject by means of another set of ordinal numbers which represent some features of the books other than their thought content". The job concerned with further individualisation of books within an ultimate class number is taken over by the Book Number.

Besides Class Number and Book number, in certain cases, Collection number also plays a vital role in retrieval of documents in the libraries.

12.2 CALL NUMBER

As mentioned above, in order to retrieve or call a book from the shelves in the libraries there must be a number, which is called as the Call Number. The Call Number fixes a book's position relatively to other books besides inividualising it among other books. A Call Number usually consists of three parts viz. (1) Class Number, (2) Book Number, and (3) Collection Number. Although, collection number is listed as the third part of a call number, it can be written above the class number and book number in the following fashion.



Self-Check Execise - 1

(a) What is Call Number ?

Note : i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this unit.

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"The Class Number of a book is a translation of the name of its specific subject into the artificial language of ordinal number" (CC6). In other words, it is the number for the subject contained by the book. The construction of a class number has been dealt with thoroughly in the previous units and also in the course on classification practice. Therefore, in this unit we shall deal with Collection Number and Book Number. In the following sections an account of Book Number and Collection Number is presented.

12.3 BOOK NUMBER

The Book Number of a book is a symbol used to fix its position relatively to the other books having the same ultimate class. It also individualises it among the books sharing the same class number. The Book Number of a book is the translation of the names of certain other features of the book into the artificial language of ordinal number other than the subject of the book. In the words of Satija, "the book number is any device, simple or complex, systematic or

arbitrary, used to sub-arrange books within a given class". Depending on the scheme of Book Number a book number may consist of one or more features of the book. Many classificationists and library professionals have attempted to evolve methods of assigning book numbers. Mention may be made of Dewey, Cutter and Sanborn, Ranganathan, and others. Among the various methods adopted to arrange the books within the class number on the shelves the following are the most widely used:

1. Chronologically by date of publication
2. By value of subject matter (first book first or first book last)
3. By accession number
4. Alphabetically by author
5. Combination of more than one feature
6. Facet formula of Dr. S.R. Ranganathan

Usually, in practice the book numbers at present constitute more than one feature.

Arrangement by the order of accession numbers or chronological order by date of publication has been in force in older libraries and they are suitable for small libraries but not for large libraries. For instance, let us examine the following examples.

(a) Order of Accession Numbers

(1)	(2)	(3)	(4)	
2:51	2:51	2:51	2:51	Class Number
10	26	72	107	Accession Number (i.e. The book Number here)

(b) Chronologically by Date of Publication.

(1)	(2)	(3)	(4)	
2:51	2:51	2:51	2:51	Class Number
1933	1942	1960	1988	Book Number (by the year of publication of the book)

From the above it can easily be understood that more than one book by an author on the same ultimate class get scattered among books by other authors on the same class. But, book number by year of publication of the book enables collocation of latest books or books on a particular subject during a given time / year.

The practice with regard to book numbers is divergent among libraries even if they follow a particular scheme of classification. It is because of lack of provisions for book number in many a classification scheme. And so, the practice is against the Canon of Book Number. Before going to learn about the other methods of book number let us see what does the canon of book number perscribes.

Self-Check Execise - 2

(a) What is a Book Number ?

Note : i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this unit.

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12.3.1 Canon of Book Number

The canon of book number reads, "a scheme for book classification should include a scheme for book numbers in order to individualise the documents having the same subject as their ultimate class and to mechanise their preferred arrangement among themselves" (*Prolegomena;* 1967.p. 503). Thus, at a point where the class number is unable to individualise the books, the job is taken over by the book number. It is Ranganathan's *Colon Classification* which makes necessary provisions for book number.

12.3.2 Uses of Book Numbers

Satija listed the several uses of book numbers. Book numbers have a well defined role in taking book arrangement to its logical conclusion on the shelves. In conjunction with class and collection numbers, they constitute a unique call number for the book. Yet these are considered optional by many librarians, especially those who do not believe in close classification. However, book numbers are used to

1. Fix the exact position of a book within a given class.
2. Make shelving and location of books easy and exact.
3. Help as an element of record in charging and discharging of books.
4. Be equally useful in arranging catalogue card entries in inventorying and stocktaking of library material if it is done with the shelf-list.
5. Bring together all the books of an author within a given class, if the arrangement is alphabetical.
6. Bring together different editions and various copies of a book.
7. Bring together a host and all its associated books together on the schelves.
8. Bring together all the books by and on a prolific writer.
9. Depict the historical development of a specific subject if the book numbers are of a chronological variety.

Similary, many more uses of book numbers can be enumerated. The role of book numbers in arranging books in classes such as fiction and biography is crucial. In the Library of Congress Classification and in Colon Classification, author numbers form a part of the class number.

Self-Check Execise - 3

(a) What are the uses of Book Numbers ?

Note : i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this unit.

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12.3.3 Author Marks

Representation of other features of the books by another set of ordinal numbers, in order to individualise book on an ultimate class may take into account various other features of the book other than the thought content, such as Form, Language, Author, Title, Date of publication, etc. However, individualisation by the names of the authors is most widely practiced as it is easily understood by the users.

This method enables collocation of the works of an author on an ultimate class. For the sake of representation of the name of the author under book number various tables of Author Marks have been developed. When the Author marks are used in conjunction with and as auxiliaries to the notation proper or the Class Number, they are called "Book Number". There are two types of Author Marks:

I. Author Marks which are totally alphabetical; and

II. Author Marks which are a combination of letters and figures.

I. Purely Alphabetical

This method is described by Sayers in the following words: "When the whole question of author marks has been considered, we think something may be said for using the first three letters of the author's name, without any further refinements; at least where books are not charged by combined class marks and author number. Thus under this method the first three letters of the name of the author are used as author mark.

Ex: *Prolegomena to library classification,* by S.R. Ranganathan.

This title gets the following Class and Book Numbers.

025.4 Class number as per the DDC

RAN (Book Number) First three letters of the author's name.

But this simple type of book number can not individualise: (a) Different editions of the same book; (b) Books by different authors, the first three letters of whose names are identical e.g. : Ranga, Ranganathan, Rana, Ranadheer, etc., (c) Different copies of the same book(d) different titles of the same author on the same subject; and (e) Different volumes of a multi-volumed book.

Of course, no system of book number is fully effective. However, the practice of the use of Author Marks is most popular now and is being used in many academic and public libraries with title modification for further individualisation by adding the first alphabet of the title of the book or in some cases by the year of publication of the book, etc. As per this practice, the example shown above may get the following numbers.

(1) 025.4 ——— Class Number

RAN P ———The first letter of the title of the book

└——— Author mark

(2) 025.4 ———Class number

RAN 1967 ——Year of publication of the book

└——— Author mark

In spite of the above modifications in big or large libraries individualisation would be a problem as, there may be more than one title beginning with the same letter and more than one book published in the same year.

II. Author marks which constitute a combination of letters and figures

In this method besides the use of alphabets, numerals are also used to represent the name of the author in the book number.

(i) Dewey's Author Number

Melvil Dewey suggested the construction of the book number through individualisation according to the name of author. He has adopted the method of, "translation systems by which a name is represented by its initials and with the remaining letters translated into numbers : e.g., Freeman, 585". Dewey also described three other methods of constructing book numbers, such as, special author tables, time numbers and accession order.

In an appendix to the 13th edition of the *Decimal Classification* a special series of marks which are called "Olin Book Number' is formulated. These numbers are constructued to assist in the alphabetical arrangement of collected biography. These are so arranged that all names are translated into a letter 'A' follwed by a number. These could be used with the Cutter Author Marks without having any difficulty.

Examples :

A	A11	Ga	A35
Ba	A12	I	A45
Day	A25	Na	A64
Ea	A28	S	A84
		Z	A99

(ii) Cutter Book Number

Charles Ammi Cutter had formulated a system of book number which was explained in his *Expansive Classification: First Six Systems*. This is well known throughout world. It is almost similiar to that of Melvil Dewey's Author Mark. It is an alphabetical table consisting of the first letter or letters of the author's name followed by a number. The table is in three sequences: (a) the consonants, (b) the vowels, and (c) the alphabets. In the case of consonants only the first letter of the author's name is used. In the case of an author's name which begins with a vowel and the letter S, the first two letters are used. If the author's name begins with the letters SC, the first three letters of the authors name are taken to construct the book number, the vowels and the letter S are fitted with lower case alphabets and numbers. The following illustrate how the consonants, vowels and the letter S numbers are presented in this system:

Examples :

(a)	Consonants	
	Beard	B34
	Holmes	H73
	Huxley	H98
	Lowell	L95
	Macaulay	M11
(b)	Vowels	
	Abbot	Ab2
	Anne	An7
	Edwards	Ed9
	Olney	O16
	Upton	Up1
(c)	S & SC letter (s)	
	Smith	Sm5
	Swain	Sw1
	Scammon	Sca5
	Schopenhauer	Sch6

(iii) Cutter-Sanborn Author Table

Kate E. Sanborn revised the Cutter Author marks and fitted them with three figures. The revised version is at present known as 'Cutter-Sanborn Three figure Author Table'. This is used all over the world usually with Dewey Decimal Classification. The letters J, K, Y, Z, E, I, O, U and letters Q and X are fitted with two figures and one digit numbers respectively. The rest of the letters are fitted with three digited numbers. The arrangement of the table is alphabetical, but the vowels and S are given after the consonants.

An example from the table is given below:

Na	111	Pa	Yor	61Zet
Nass	112	Pac	York, J	62Zeu
Nab	113	Paacu	York, P	63 Zev.
Nabb	114	Pacc	Yorke	64Zi
Nabc	115	Pace	Yorke, M	65Zic
Nabi	116	Pach	Yot	66Zieg
Nabo	117	Paci	You	67 Zies
Nac	118	Pacin	Young	68Zib
Nach	119	Pack	Young, C	69 Zil

The numbers given in the centre in these tables are applicable to letters appearing on both sides of the numbers. The first letter in the surname of the author is to be fitted with the number given in the concerned letter group in the table. In case the first three letters of the surname of the author come between two combinations of alphabetical sequences provided in the table, the first number should be preferred. For further individualising the call number of each document, the initial letter of the title of the document is added to the Cutter-Sanborn Author Mark.

Example : The document entitled *The Rhetoric of Criticism* by Sarcha Talmor will get the following book number : T151R.

When there is more than one copy of the same work, the copy number is added to the book number (if desired) as 2 for the second copy, 3 for the third and so on.

Example : 4th copy of Daniel Defoe's *Robinson Crusoe*

823.5 ——— Class Number

D314R4 ——— Copy Number

R ——— Initial letter of the Title

D314 ——— Author Mark

The figures used in the tables are regarded as decimal fraction notation. In the case of authors whose names are common, if the book number available is already used for one of them, another decimal is added to the number.

Example: Herder, A = H541

Header, T = H5413

Herdman = H5415

In large libraries where there are many translations of a work, the initial of the language, a capital letter is added to the author mark.

Example : Goethe's *Faust* G599F

Goeth's *Faust* in English G599F.E

If there are several translations of the work, *Faust*, in English, they are distinguished from one another by adding the initial of the translator's name to the language mark.

Examples :

Goethe's *Faust*	in English	G599F.E
Goethe's *Faust,*	in English by Austin	G599F.Ea
Goethe's *Faust,*	in English by Brown	G599F.Eb

When the number of editions of a single work exceeds or is likely to exceed 9, the various editions are distinguished from one another by adding the year of publication of the edition instead of numbers, such as 2,3,4,5 and so on.

Examples :

Paradise Lost, by Miltion 1667 edition	M662P 1667
Paradise Lost, by Milton 1732 edition	M662P 1732
Paradise Lost, by Milton 1734 Edition	M662P 1734

If commentaries and criticism on any work are to be arranged immediately after the work, the letter Y (capital) is added to the book number and, if necessary, the initial of the commentator or the critic is added to the number. For dictionaries and concordances the letter Z is added.

Examples :

Commentary on the *Poems of Yeats* by Jeffers	821.912 YEA YJ
Concordance to the Poetry of John Milton, by William Ingram and Katheleen Swain	821.4103 M662z

However, book numbers consisting of Author Mark with figures do hardly serve any extra pourpose and differ from purely alphabetical author marks as far as collocation is concerned. Further, the disadvantage is that, for translation of the name of the author into figures we may have to waste time in consulting the tables of author marks. But the advantage would be comparatively easier for filing and retrieval of books.

Self-Check Execise - 4

(a) What are the advantages and disadvantages of Author Marks ?

Note : i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this unit.

.....

.....

.....

.....

.....

12.3.4 Other Systems

G.C. Makkar presents *Three number Author table : refreshingly original in concept.* In fact, his system is refreshingly original in concept. He presents an exhaustive three number author marks for Letter 'A' which can be used as parallel numbers for all other letters.

Besides individualisation of books on an ultimate class by author mark, as mentioned earlier individualisation can be done by other features also. Walter Stanely Biscoe put forward a method to subarrange books by year of publication. The year of publication, which is the essential basis of Biscoe's method, is converted for brevity and simplicity into alphanumeric notation from the following table:

A	B.C era	J	1830-1839	S	1920-1929
B	A.D.1-999	K	1840-1849	T	1930-1939
C	1000-1499	L	1850-1859	U	1940-1949
D	1500-1599	M	1860-1869	V	1950-1959
E	1600-1699	N	1870-1879	W	1960-1969
F	1700-1799	O	1880-1889	X	1970-1979
G	1800-1809	P	1890-1899	Y	1980-1989
H	1810-1819	Q	1900-1909	Z	1990-1999
I	1820-1829	R	1910-1919		

James Duff Brown, among the most eminent of British librarians, proposed another chronological system in the first edition of his Subject Classification (1906) and carried it in the subsequent two editions (1914, 1939) the last being posthumous. Therein he also surveyed the then existing major book numbering systems. His "Extended Date Table" subarranged books by year of publication denoted by two small alphabets. The range of his table extends from AD 1450 to 2125.

S.R. Ranganathan, by disposition choose chronological book numbers, because to him an alphabetical arrangement was only better than no arrangement. For his Colon Classification he devised a system of book numbers no less befitting and no less systematic, sophisticated, and efficacious than his faceted classification. But, his system being a systematic and comprehensive, ignores author element and so it can not ensure the collocation of various works of an author on a particular subject. In the following section his system of book numbers is dealt with in detail.

Ranganathan's Facet formula of Book Number

Ranganathan's system of book number is in conformity with his faceted scheme of classification. Therefore, for the sake of book numbers also he presented a facet formula in Colon Classification. The formula provides for all possible characteristics which are likely to arise in the expression of an idea in forming a work and also the characteristics likely to arise in embodying a work in the form of a book. In chapter 3 of Part 1 of the *Colon Classification* scheme, Ranganathan has given a detailed description of the construction of book number. At page 1.13 of *Colon Classification,* a special chronological table for the construction of Book Number under facet (y) is given. In chaper 2 of part 2, the list of isolates to be used under the facet of Form (F) is given.

The facet formula for book number provides in the Colon Classification by Dr. Ranganathan is as follows:

[L] [F] [Y] [SN]. [V] - [S]; [c] : [EVN]

The symbols used in the facet formula are explained below, along with examples:

L = Language of the document : The language number is to be obtained from the schedules of language isolates (*Colon Classification,* Chapter 5, p. 2.26)

Examples :

	Class Number	Book Number
Sociology Book in Hindi	Y	152
Sociology Book in Telugu	Y	35

F = Form of exposition of the document : This is to be obtained from the schedules for the form of exposition given in chapter 2 of part 2 of the Scheme. According to the concept of favoured facet formula, the number for the form facet can be omitted in case of prose, as prose is the form of the majority of the documents in the library.

Examples :

	Class Number	Book Number
Lectures on Religion	Q	p1
Mathematics through Pictures	B	f

Y = Year of publication of the documents : This is to be obtained from the chronological schedules given in chapter 3 of Part 2 of the Scheme. Libraries, whose collections mostly constitute of publications after 1900 may allow the special chronological schedule for book number given at page 1.13 of the Scheme.

Examples :

	Class Number	Book Number
Introduction to Psychology (Published in 1965)	S	N65
Outlines of Psychology (Published in 1975)	S	N75

SN = Serial Number : In the earlier editions of *Colon Classification* the symbol used for this part book number was A, i.e., Accession Number. It is used to individualise different books belonging to the same ultimate class with same language and form numbers and published in the same year. The books are arranged in the sequence of accession numbers beginning with 1 for the second book received in the library. 2 for the third book and so on.

Examples:

	Class Number	Book Number
A book on Physics published in 1984, The first book acquired by the library.	C	N84
A book on Physics published in 1984 The second book acquired by the library	C	N841
A book on Physics published in 1984. The third book acquired by the library.	C	N842

V = Volume number : A document may happen to be published in more than one volume like most of the multi-volumed encyclopaedias. All these volumes instead of being scattered according to the year of their publication, should be placed or found together in the library because of their having certain characteristics in common like common index, common pagination and scattered nature of the subject throughout the volumes. The number of the volume is taken from the volume itself.

Example : *Dewey Decimal Classification* (18th edition) was published in 1971 in three volumes, viz., V.1 : Introduction, Tables; V.2 : Schedules; and V.3 : Index. The class number and book number for each of these volumes will be constructed as follows:

	Class Number	Book Number
First Volume	2:51M	N71.1 ——Volume Number └——— Year of publication
Second Volume	2:51M	N71.2
Third Volume	2.51M	N71.3

S = Supplement Number : Certain documents which are found in a set or otherwise have supplements. The supplements, though published much later, should be placed in juxtaposition with the volumes to which they are supplements for the sake of convenience in the libraries. The supplement's number is taken from the document itself. The book number for the supplement is constructed by taking the book number of its parent volume first and then adding to it a dash (-) and the number of the supplement in Indo-Arabic numerals.

Example :

	Class Number	Book Number	
Dewey Decimal Classification Vol.2 : Schedules	2:51M	N71.2	
Supplement to Dewey Decimal Classification Vol.2 : Schedules	2:51M	N71.2 - └— -Second volume	First Supplement

C = Copy Number : Libraries sometimes posses more than one copy of the same document. All such copies come together in the library in the same ultimate class with the same book number. For further individualisation of these copies in book number, the copy number is used. The first copy of the document shall not get any copy number, the second copy of the same document will get 1 and the third copy 2 and so on. These copy numbers are to be preceded by a semicolon.

Example:

	Class Number	Book Number	
Human Physiology Published in 1983 First copy acquired by the library	L:3	N83	
Human Physiology. Published in 1983 Second copy acquired by the library.	L:3	N83;1	Copy Number

EVN = Evaluation Number : In the earlier editions of *Colon Classification* this was known under the symbol, Cr. i.e., Criticism number. When a document cannot fulfil the needs of the classic device it will be called a 'pseudo classic' or ' a pedestrain work'. When another document/

book is written on such a pedestrain work as criticism or appreciation or as a reply, such books should be kept along with the first document for the sake of convenience in the libraries. The first book is called 'Host book' and the later ones are known as ' associated books'. The book number of the associated book should be similiar to that of the host book followed by colon : and the symbol 'g'. If there are more than one such associated books they should be further individualised. Ranganathan says that " the book number of the second, third, etc., associated books of the same host book should consist of that of the first, followed by the digit 1,2, etc. respectively".

Example :

	Class Number	Book Number
Bird Migration in India, by Mohan Alva (Published in 1978)	K96:58.44	N78
A Critical Study of Mohan Alva's Bird Migration in India, written by S. Das. (This is the first critical work on Alva's book)	K96:58.44	N78:g
Half truths in Mohan Alva's Bird Migration in India, by Rehman Ali, (This is the second critical work on Alva's book)	K96:58.44	N78:g1

The facet formula examined above has no provision for bringing together various editions of a document. According to the facet formula, different editions of a document on the basis of their years of publication will get different book numbers thus scattering them to different locations though belonging to the same ultimate class. In order to bring together the various editions of a document in libraries, Dr. Ranganathan has suggested that "the numbers of the year of publication of the successive editions may be used as if they were numbers", and as a result the successive editions of a document can come together in a sequence.

Example : ***Library Administration : Theory and practice*** by R.L. Mittal.

	Class Number	Book Number
1st edition (Published in 1964)	2:8	N64
2nd edition (Published in 1969)	2:8	N64, N69
3rd edition (Published in 1973)	2:8	N64, N73
4th edition (Published in 1978)	2:8	N64,N78
5th edition (Published in 1983)	2:8	N64, N83

12.4 COLLECTION NUMBER

A live library, big or small, Special or Academic or Public, is likely to have variety of documents in its collection. They can be : (1) Miniature books, (2) Abnormal size books, (3) Heavey books, (4) Rare Books, (5) Incunabula, (6) Manuscripts, (7) Pamphlets, (8) Reports, (9) Syllabi, (10) Off-prints and preprints, (11) Maps, (12) Inscriptions, (13) Photographs, (14) Newspaper cuttings, (15) Theses, (16) Films, (17) Cassettes, (18) Gramophone Records,

(19) Patents, (20) Periodicals, (21) Government publications, (22) Braille Books, (23) Children's books, (24) Worn-out books, (25) Microforms, etc. The list is only illustrative but not exhaustive. Such a variety of documents cannot be kept in one linear sequence as it will be unhelpful and cumbersome and also it will create confusion to the users. Facilitating the location of documents on the library shelves is one of the important objectives of library administration and also the library classification. Hence, it is necessary to group documents into different collections according to their size, nature, form, purpose, etc. in the library in order to render prompt service to the readers.

Dr. Ranganathan is the only Classificationist who has recognised the importance of forming different collections and the Collection Number. The need for forming collection has been described by him at length in Chapter 8 of his book *Library Administration.* The scheme of collection number is described in his book *Colon Classification,* in Chapter 4.

12.4.1 Colon Classification and Collection Number

According to the needs of a library, its documents can be grouped into different collections. Grouping of documents into different collections is normally done" on the basis of the peculiarities of their gross bodies, or their rarity or service exigency to facilitate use by readers". The possible different collections formed in a library on account of the size of documents, rarity of documents, and service exigencies can be:

1. Miniature collection
2. Abnormal size documents collection
3. Pamphelts collection
4. Reports collection
5. Microfilm collection
6. Maps collection
7. Non-book materials collection
8. Newspaper clipping collection
9. Manuscripts collection
10. Incunabula collection
11. Worn-out books collection
12. Theses collection
13. Reading room collection
14. Departmental collection
15. Textbook collection
16. Periodical collection
17. Reference collection
18. Topical collection
19. Language-wise collection

Ranganathan has systematically analysed the collections and recognised three broad kinds of collections. They are (1) the permanent collection, (2) the quasi-permanenet collection, and (3) the temporary collection.

Examples: Reading room collections and departmental collections of a Public Library are permanent ones. The text book collections in Academic libraries, departmental collections in academic and special liberaries are generally quasi-permanent in view of the possible changes

in curriculum. Topical collection is a temporary one. The temporary collection is dismantled as soon as its purpose is over. In the case of permanent and quasi-permanent collections, collection marks are given on the spine of the books in the collections and also on the catalogue entries of the books for the purpose of locating and replacing them easily. In the case of temporary collections the collection mark is put on the date label indicating the date on which the documents should be replaced at their permanent place.

Ranganathan has defined the Collection Number as "the mark added to class number-cum-book number of a book to indicate the collection containing it". The collection number is a symbol assigned to books which from different collections other than the main collection.

12.4.2 Cannon of Collection Number

Dr. Ranganathan enunciated a canon of collection number. It says, "A scheme for book classification may be provided with a schedule of collection numbers to individualise the various collections of special documents to be framed on the basis of the peculiarities of their gross bodies or their rarity or service exigency to facilitate use by reading".

12.4.3 Scheme of Collection Number in Colon Classification

In Chapter 04 of *Colon Classification,* Dr. Ranganathan has given a scheme of collection number. The various symbols adopted for collection numbers are given below with examples:

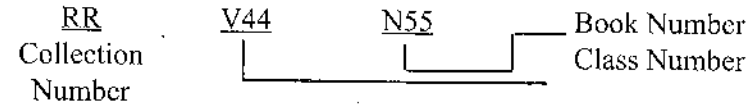
Nature of Collection		Collection Number	Example
1.	Under sized	Underline Book Number	V45 N55
2.	Over sized	Overline Book Number	V45 $\overline{\text{N55}}$
3.	Abnormal	Underline and Overline Book Number	V45 $\underline{\overline{\text{N55}}}$
4.	Worn-out	Encircle Book Number	V45 (N55)
5.	Reading Room	RR	
6.	Periodicals	PC	
7.	Film Strip	FS	
8.	Film Roll	FR	
9.	Text Book	TC	
10.	Rare Book	RB	
11.	Manuscript	MC	
12.	Physics Department	CD	The first alphabet, represents
13.	Chemistry Department	ED	the subject, taken from *Colon*
14.	History Department	VD	*Classification* D stands for
15.	Agriculture Department	JD	Department

The collection number scheme is formulated and maintained by the Maintenance Section of a library. The scheme is controlled through the shelf register. The collection is not permanent in all cases. This is not used in general and national bibliographies.

After deriving all the components of a call number viz., the Class Number, the Book Number and the Collection Number, they are written both horizontally and vertically on the lable, Book Card, Due date slip, Catalogue entries, etc. But, a double space should be given between each of the components especially when they are written horizontally.

The following are the two examples of writing the three components, viz., Collection Number, Class Number and Book Number horizontally and vertically:

(a) Horizontal one:



(b) Vertical One:

RR	-	Collection Number
V44	-	Class Number
N55	-	Book Number

12.5 SUMMING UP

Books and other reading material in library can be retrieved or called from the shelves or places where they are stored/filed with the help of a number. This number is called the Call Number. The Call Number consists of three parts : Class Number, Book Number and Collection Number. The class number is an essential part of call number, whereas the book number can be omitted in certain cases. However, the collection number is required in fewer cases, and is necessary only in a library catalogue or in libraries. It is because of these reasons that many of the schemes of classification do not provide for the book number and collection number. The class number is coined with the help of schemes of classification. The Book numbers are of various types and represent various features of the books other than their thought content. There are various methods of derving book numbers based on Author Marks, date-tables, facet formula, etc. The collection number has been practically neglected by all the schemes except *Colon Classification.*

14.5 MODEL ANSWERS

1. Call Number is that number, with the help of which books in the library can be retrieved or called from the shelves. The call number fixes a book's position relatively to other books besides individualising it among other books. A Call Number usually consists of three parts viz., (1) Class Number, (2) Book Number, and (3) Collection Number.

2. A Book Number is a symbol used to fix the position of a book relatively to the other books having the same ultimate class. It also individualises it among the books sharing the same class number. The book number of a book is the translation of certain other features of the book into the artificial language of ordinal numbers other than the subject of the book.

3. Book Numbers are used to:

   1. Fix the exact position of a book within a given class.
   2. Make shelving and location of books easy and exact.
   3. Help as an element of record in charging and discharging of books.
   4. Be equally useful in arranging catalogue card entries in inventorying and stocktaking of library material if it is done with the shelf-list.
   5. Bring together all the books of an author within a given class, if the arrangement is alphabetical.
   6. Bring together different editions and various copies of a book.
   7. Bring together a host and all its associated books together on the shelves.

8. Bring together all the books by and on a prolific writer.

9. Depict the historical development of a specific subject if the book numbers are of a chronological variety.

4. The advantage of Author Marks are:

The author marks are easily understood by the users and this method enables collocation of the works of an author on an ultimate class. Though it involves certain waste of time for translation of the name of the author into figures the advantage is that it is comparatively easier for filing and retrieval.

The disadvantages of Author Marks are:

The translation of the name of the author into figures results in waste of time for the consultation of the tables of author marks. Secondly, the author marks cause scatter among the books, on an ultimate class, which belong to a particular period. Finally, the names of the authors which bear the same initial letters pose a problem to the author marks

12.7 ASSIGNMENTS

1) Compare and contrast the Cutter-Sanborn Author Marks with the Ranganathan's Facet Formula for book number and state which is preferable and why ?

2) Explain the various components of a Call Number with examples of their writing on the books lables.

3) List out different collections found in a big library and suggest a scheme of collection number.

4) Discuss various methods relating to Book Number with their relative merits and demerits.

12.8 RECOMMENDED BOOKS

Krishan Kumar. *Theory of Classification.* New Delhi : Vikas Publishing House, 1983. (Ch. 22.P. 340-352)

Makkar, G.C. *Three Numbers author table : Refreshingly original in concept.* New Delhi. Today and Tomorrow's Printers and Publishers, 1974.

Philips, W. Howard. *A Primer of Book Classification.* 5th ed. London: Association of Assistant Librarians, (Section of Library Association), 1961. P. 50-55.

Raju, A.A.N. *Decimal, Universal Decimal and Colon Classification: a study in comparison.* Delhi : Ajantha Publications, 1984. P. 143 - 150.

Ranganathan, S.R. *Colon Classification.* 6th ed. Bombay : Asia Publishing House, 1960. (Chapter 01, 03 and 04)

Ranganathan, S.R. *Prolegomena to Library Classification.* 3rd ed. Bombay : Asia Publishing House, 1967 (Repring by Bangalore : UBS Publishers, 1990). (pt. U and V)

Ranganathan, S.R. *Library Administration.* 2nd ed. Bombay: Asia Publishing House, 1960. (Chapter 8)

Satija, M.P. *A Printer on Ranganathn's Book Number.* Delhi : Mittal Publications, 1987.

Satija, M.P. 'Book Number and Call Number'. *Encyclopaedia of Library and Information Science.* New York : Marcel Dekker Inc., c 1990. V 45 (Supplement 10) P. 18-45.

Sayers, W.C.B. *Manual of Classification for Librarians and Bibliographers.* 3rd ed. London: Andre Deutsch; Calcutta: Rupa & Company, 1962. (Chapter on Book Number and Work Number)

Wynar, Bodha S. *Introduction to Cataloguing and Classification.* 5th ed. Littleton, Colo : Libraries Unlimited, 1976. P. 227-280

12.9 GLOSSARY

Author Marks : A symbol following the class number in the call number of a bibliographic item to represent the name of the person or corporate body i.e. the main entry heading ; used as a device to facilitate alphabetical arrangement by the name of the person or corporate body responsible for the context of bibliographic items with the same class number. Synonymous with Author Number/Book Number.

Book Number : The combination of symbols in a call number which distinguishes an item in a library collection from all other items in the same class number, ordinarily includes as author mark and work mark. Synonymous with Book marks.

Call Number : The set of symbols identifying a particular item in a library collection and indicating its location. Usually includes a class number and a book number. Synonymous with Call mark and Shelf mark.

Collection Number : In the Colon Classification, it is a suitable symbol to be determined by each individual library, and added to the class number and book number to indicate the Collection to which the book belongs.

Cutter Book Number: An alphanumeric code for a main entry heading, the first word other than an article of the bibliographic description, the name of a biography etc. taken from or based on a Cutter table or the Cutter-Sanborn Table and forming part of the book number assigned to a bibliographic item.

Cutter-Sanborn Table: A modification of the two-figure Cutter table by Kate E. Sanborn; uses single letters and three numbers to provide symbols to be used as author marks.

12.10 MODEL EXAMINATION QUESTIONS

I. ESSAY QUESTIONS

1) List out various methods of assigning Book Numbers. Briefly describe each with an example.

2) Critically examine the merits and demerits of Dr. S.R. Ranganathan's method of Book Number.

3) What is Collection Number ? Discuss its importance in libraries.

II. SHORT NOTES

a) Cutter-Sanborn Author Table

b) Call Number

BLOCK-IV : SCHEMES OF LIBRARY CLASSIFICATION

This block introduces to the important general schemes of classification, such as Dewey Decimal Classification (DDC), Universal Decimal Classification (UDC) and Colon Classification (CC). The salient features, structure, extent of use and other important aspects of the Schemes are presented.

In Unit - 13 you will learn about the Dewey Decimal Classification. Started in 1876, it has now reached 21st edition. It is the most popular scheme of library classification used by libraries throughout the world.

Unit - 14 deals with Universal Decimal Classification. It is considered as the first faceted scheme of library classification. It is a scheme for classifying information / documents on all subjects and in all forms.

In Unit -15 you will learn about the Colon Classfication. Colon Classification is the best example of analytico-synthetic classification scheme, devised by Dr. S.R. Ranganathan.

The trends and developments in library classification are discussed in the last unit, i.e., Unit -16 of the Block.

UNIT - 13 : DEWEY DECIMAL CLASSIFICATION (DDC)

Contents

13.0 AIMS AND OBJECTIVES

Classification is an important technique for the arrangement of multitude of books in a library. You have already studied the need and purpose of library classification. In this unit you are given a detailed description of the Dewey Decimal Classification.

After going through this unit you will be able to understand

- the background, development and salient features of DDC;
- characteristics of various editions of DDC;
- salient features of DDC 19th Edition; and
- various devices, merits and demerits of DDC.

13.1 INTRODUCTION

Melvil Louis Kossuth Dewey is the full name of the designer of the classification scheme which is popularly knwon as Dewey Decimal Classification. He was born in Adams Centre, New York on 10th December. 1851. In 1872, at Amherst College he obtained a job as student library assistant. Later he was promoted as Asst. College Librarian and subsequently as Acting librarian. During his work he has realised that there was an urgent need to reorganise the library. He conceived the idea of classification of books in library according to their specific subject contents. He also observed that the method of shelf arrangement of books that was in use at that time caused frequent shifting of books, low efficiency in case of retrieval of documents, and wasteful expenditure of both time and money due to duplication of work in reclassification. These factors led him to develop a simple scheme, which would be helpful and suitable to all kinds of libraries to be used throughout the world As a result of his study of various libraries and having made personal visits to various American libraries, in 1876 he published in the *Library Journal,* anonymously a work entitled, *A Classification and Subject Rules for Catalogue and Arranging the Books and Pamphlets of a Library.*

13.2 DIFFERENT EDITIONS

13.2.1 First Edition

The first edition was a 42 page pamphlet consisting of 12 pages of introduction, 12 pages of tables and 18 pages of index. The schedules enumerated about 1000 subdivisions. It was however criticised as being too minute sub-divisions in the angle of many big libraries. There was an immediate reaction to this by librarians and the usefulness of this scheme was appreciated.

13.2.2 Second Edition

The second edition was published in 1885 with title as *Decimal Classification and Relative Index.* It was an important edition in many respects. It was the basis for all later editions including DDC 20. In the schedules it was more than eleven times larger than the first edition as far as the number of pages are considered. It was demonstrated for the first time the potential of a notation composed of decimal fractions. The use of three digit notation with a decimal point following the third if further sub-divided was followed. Another synthetic device called Divide like was introduced. There were specific instructions given under many class numbers regarding divide like.

13.2.3 Third to Fourteenth Edition

During the next 57 years editions from 3-14 were published at different intervals which may range from 2-12 years. Dewey himself supervised and revised upto the 13th edition. His

interest in simplified spelling was reflected in the schedules. The editions 3-14 followed the pattern as established in the 2nd edition. Although the scheme has grown considerably in size but the pattern was almost the same in all the editions. The 14th edition consists of 1046 pages of schedule, 737 pages of index and 17 pages of auxillary tables.

13.2.4 Fifteenth Standard Edition

Edition fifteen was called as "Standard Edition". It was mainly intended to provide for the classification of collection upto the size of 2 lakhs documents. It appeared in 1951 and has been edited by Milton J. Ferguson. It was designated on the title page as "Dewey Decimal Classification and Relative Index".

The fifteenth edition was not received well by the users. It was worse than a failure. It was a disaster. Subsequently a revised fifteenth edition was brought out under the editorship of Melvil Dewey's son Godfrey Dewey. It provided a new index. It also provides certain brighter aspects.

13.2.5 The Sixteenth Edition

The sixteenth edition was published in 1958. It was in line with 14th edition. It was broughout in the interval of 7 years. It was brought in 2 volumes. It continued some of the innovative features of the 15th edition like standard spelling, current terminology, etc. The index was published as a separate volume and was relatively more detailed than that of the 14th edition. The sixteenth edition also contains the phoenix schedules.

13.2.6 Seventeenth Edition

It was brought out in 1965 in two volumes edited by Benzamin Custer. The volume 1 meant for Tables and volume 2 meant for Schedules and Index. This edition showed more trend towards synthesis and retaining the significant features of 16th edition. The Table 1 Form divisions was renamed as Standard sub-divisions and Table 2 was named as Areas Table. It tried to remove inconsistencies and obsolescence of hierarchical order in the previous edition. For the first time in this edition a separate Areas Table has been introduced.

13.2.7 Eighteenth Edition

This edition was published in 1971 with completely a new format of three volumes. Volume I Introduction and Tables, Volume II Schedules and Volume III Index. This edition provided for the first time more synthetic devices in the form of Tables known as Auxillary Schedules.

The following are the Tables provided in the Volume I:

Table 1	Standard Sub-division.
Table 2	Areas
Table 3	Sub-divisions of Individual Literatures.
Table 4	Sub-divisions of Individual Languages.
Table 5	Racial, Ethnic, National Groups.
Table 6	Languages
Table 7	Persons.

The schedules for Law and Mathematics have been completely remodelled with phoenix schedules. The other new features of the edition are a glossary and index to preface, editior's introduction, printing of Dewey's portrait as a frontispiece. On the whole it is a real step forward for the transformation of the scheme into a mere synthetic scheme.

13.2.8 Nineteenth Edition

This edition was brought in 1979 in 3 volumes. Volume 1 Introduction and Tables, Volume 2 Schedules and Volume 3 Index. This was edited by Benzamin A. Custer like the previous edition. It was carrying all the features of the previous one with some few additions. Table 3 has been divided further as Table 3 and 3 A. The Table of precedence and centred heading which were first introduced in the eighteenth edition are also continued.

13.2.9 Twentieth Edition

This was brought out in 1989 in 4 Volumes:

Vol 1	Introduction and Tables
Vol 2	Summaries and Schedules (000-599)
Vol3	Schedules (600-999)
Vol 4	Relative Index and Manual.

After the publication of the 19th edition in 1979 a manual was issued in 1982 whereas in 20th edition, the 4th volume contains the manual along with the Relative Index.

13.2.10 Twenty First Edition (DDC21)

The latest edition (DDC21) has many interesting features. The OCLC Forest Press, Ohio (USA) offers the scheme in two convenient formats: (i) Print Edition - A traditional four volume set; (ii) A New Microsoft Windows Version - *Dewey for Windows*. This newest revision of DDC 21 is the Electronic Dewey published in 1996. This is available in Microsoft Windows based version on compact disc also to let you point and clock your way through familiar DDC f nctions, expanded search and display options and ability to share a single CD-ROM among multiple users on a LAN.

In DDC21 there are three major changes in the classes 350 - 354 Public Administration, 370 Education and 560-590 Life Sciences. In tables, some changes are made in the Standard Subdivisions. More interdisciplinary numbers are included in the schedules and entries on new topics, selected built numbers and terms are included in the relative index to provide entry vocabulary for foreign users. However, the index of the Electronic Dewey version also includes over 4000 new entries.

13.2.11 Twenty Second Edition (DDC22)

The 22nd edition is expected in the Summer of 2003.

13.2.12. Abridged DDC Editions

DDC is also available in abridged form to meet the needs of small libraries. The first edition was issued in 1894. It was about 2/5th of the size of the full edition. The recent abridged edition is the 13th edition which was issued in 1997. However, the supplements have been issued from time to time. The latest supplements issued in 2003.

Self-Check Execise - 1

In how many volumes 20th edition of DDC was published? Name each of the volumes.

Note : i) Write your answer in he space given below:

ii) Compare your answer with the model answer given at the end of this unit.

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13.3 UNDERLYING PRINCIPLES

The following principles are evident in Dewey Decimal Classification.

13.3.1 Philosophical Basis

The roots of library classification can be traced in philosophy and the DDC is not an exception to this. The outline of the main classes of the DDC is based on the schemes developed by Bacon and Harris. The philosophical base behind the order of main classes is not stated explicitly by Dewey. But its editor Benzamin A. Custer had thrown some light on this aspect. The order of main classes is based on Scheme of Harris which in turn is based on Bacon's Scheme. An outline of the classification schemes of Bacon, Harris and Dewey is given below.

Bacon	Harris	Dewey
History	Scinece	General works
(Memory)	Philosophy	Philosophy
	Religion	
	Social and Political Science	Social Sciences
		Linguistics
	Natural Science	Sciences
	Useful Arts.	
Pocsy Art	Fine Arts	
(Imagination)	Fine Arts	
	Pure Fiction	
	Literary	Literature
	Miscellany	
Philosophy	History	History
(Reason)	Geography and Travel	Geography and Travel
	Biography	Biography

(Source : A.A.N. Raju, *Decimal, Universal Decimal and Colon Classification: A Study in Comparison* (Delhi : Ajanta, 1984), p. 21)

13.3.2 Hierarchical Strucutre

DDC is a hierarchical scheme which proceeds from the general to the specific. It considers knowledge as unity and divides into main classes, sub-classes, sub-sub-classes etc., based on certain characteristics. The ten main classes are :-

000	Generalities
100	Philosophy and related disciplines
200	Religion
300	Social Sciences
400	Languages
500	Pure Sciences
600	Technology (Applied Sciences)
700	The Arts
800	Literature (Bells - Letters)
900	General Geography and HIstory.

Each main class is further sub-divided into ten divisions. Thus the process of division is continued with the help of decimal fraction notation. DDC is basically hierarchical in its notation and in its structure. Dewey decided that the notation should express the hierarchical order of the classification. Notation expresses the relationship between each unit of knowledge and its subordinate elements. Numbers are structured in such a way that classification proceeds from general to specific. The progressive steps are indicated by the addition of one new digit at each level of divisions.

13.3.3 Relative Location

Dewey introduced the concept of relative location as opposed to fixed location. He developed a notational system consisting of Indo-Arabic numerals used as decimal fractions. According to the relative location a new book on those subjects can be inserted in the middle of an existing sequence as indicated by the notation.

13.3.4 Simplicity

By its hierarchical structure the notation is very simple to understand as it conveys more clearly the structure of the notation, and at the same it is very hospitable and flexible.

13.3.5 Synthesis

Basically the DDC was brought out as an enumerative scheme of classification. But from the 16th edition onwards it slowly began to adopt the facet structure. It adopted many devices for the synthesis of notation like the use of Tables, Subject device and other instructions adding from one table to other, adding table to schedules, within the schedules etc.

13.4 SALIENT FEATURES OF DDC 19

The salient features of DDC 19 are briefly presented below.

13.41 Schedules

In pursuance of many efforts, the 19th edition of DDC appeared in 1979 in three volumes.

Volume 1	Introduction and Tables;
Volume 2	Schedules; and
Volumes 3	Relative Index

Schedules are the main part of the scheme, consisting of 21,504 entries, when compared with 18,980 in Eighteenth edition, into which the universe of knowledge is divided, sub-divided at successive stages of sub-divisions till the desired level of specificity is obtained.

The first division is into ten main classes, 0-9, which embrace the whole human knowledge. Main class 0 is used for general works of many subjects from many points of view. e.g. General newspapers, encyclopedias, and also for certain specialised disciplines that deal with knowledge generally, such as Information science, Communication, Library Science and Journalism. Each of the main classes 1-9, consists of a major discipline or group of related disciplines. Following are the ten main classes with their assigned meanings:

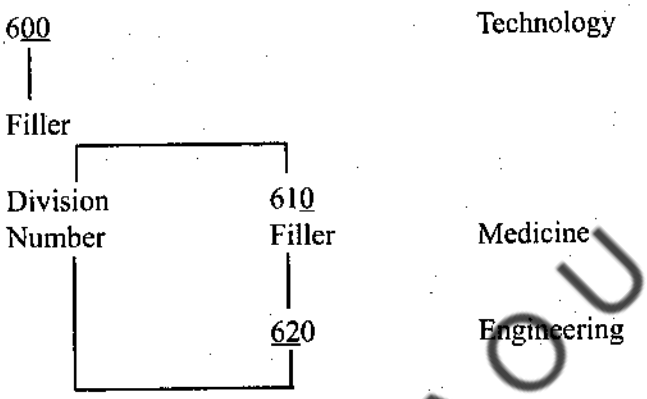
000	Generalities
100	Philosophy and related disciplines
200	Religion
300	Social Sciences
400	Language
500	Pure sciences

600	Technology (Applied Sciences)
700	The Arts
800	Literature (Belles-Letters)
900	General Geography and history.

The above ten classes are represented by numbers 0-9, conveying some assigned meaning. Because of the Three Digit minimum principle, which has been introduced in 2nd edition, the substantive digits of main classes are filled with two terminal zeroes, to make the notation atleast 3 digits. Thus 3 is 300. The notation, also used to designate the complete span of each main class, consists of one hundred three digit numbers, 000-009 for generalities, 300-399 for social sciences, 700-799 for the Arts.

Each main class consists of ten divisions, 0-9. These division numbers occupy the record position in notation, for example.

Main class number



Further, each division of the main class is further divided into ten sections, also numbered 0-9. The section numbers occupy the thrid position in the notation. Thus the full span of the section numbers for each subdivision listed above is 600-609, 610-619, 620-629, and so on. Thus the ten sections of the Divisions of main class 610 medicine be divided as

610	Medicine
611	Human anatomy
612	Human Physiology
613	General and Personal Hygiene
614	Public health and related topics
615	Pharmacology & therapeutics
616	Diseases
617	Surgery
618	Other branches of medicine
619	Experimental medicine

Likewise, the scheme permits further sub-division to any degree desired with a continued decimal notation i.e., by dividing a section by Ten and successive numbers by ten, if desired. A decimal point is placed between third and fourth digit. Thus 636 animal husbandry is divided into

636.1	Horses
636.2	Cattle
636.3	Sheep etc.

636.1	Horses is further divided as
636.11	Oriental Horses
636.12	Race horses
636.16	Pomies etc.

In the above example the division stops at fifth order of division. But it need not be so always. A class number is divided till the desired specificity is obtained. There is no limit to the number of digits following the decimal point. To illustrate thus, let us take another example.

620	Engineering and allied operations
621	Applied physics
621.3	Electromagnetic and related branches of engineering
621.38	Electronic and communication engineering
621.384	Radio and Radar engineering
621.384 1	Radio
621.384 13	Components
621.384 136	Receiving sets
621.384 136 6	Type of sets.

You will notice, some space between the sixth and seventh digit, and ninth and tenth digit. The spaces between the digits are not basic part of the notation, but they are left for ease in reading and copying.

Thus DDC has followed the hierarchy system in the notation structure, by dividing the universe of knowledge by ten main classes; each main class into ten divisions; each division into ten sections and subsections to the degree of specificity desired.

Self-Check Execise - 2

DDC followed ' Dividing by Ten' principle. Briefly explain.

Note : i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this unit.

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13.4.2 Citation Order

Many subjects may be sub-divided according to their characteristic, like, by process, by kind, etc. Therefore, the 19th edition of DDC has provided the following general citation order for the citation of various facets in the class number.

Things	
Kinds	of things
Parts	of things
Materials	from which the things, kinds or parts are made
Properties	of the things, kinds, parts, or materials
Processes	within the things, kinds, parts or materials
Agents	Performing such operations

e.g. A work as : Planting wheat, which deals with two characteristics; a process and a kind of crop. The classifier sometimes, faces the problem of which characteristic to class the above. For. the purpose, he has to rely on a few general principles, and occasionally simply on his judgement. It is noted, that citation order solves this problem to class the document, first by kind, 'wheat' and then by process ' planting'.

13.4.3 Notation

The notational system in DDC is hierarchical in its structure. It means that each successive division of the discipline or subject is represented by a corresponding lengthening of significant notation by one digit. For example:

600	Technology
630	Agriculture
636	Animal husbandry
636.1	Horses
636.12	Rare horses.

Another important feature of the DDC is use of the Decimal Fraction notation i.e. Dividing the Universe of knowledge into ten main classes, each main class into ten divisions, and then each division into ten sections, and so on.

DDC, being made up only of Indo-Arabic numerals, the notation is very simple and it can be easily written, read and transmitted. Moreover, Indo-Arabic numbers are in common, used throughout the world and they can show the order of classes very clearly.

In a few instances the notation is not hierarchically expressive. For example, 929.7999 is printed as co-ordinate with 929.73-79, because royalty and peerage of countries outside Europe is a concept coordinate with, not subordinate to, the concept of royalty and peerage of countries of Europe.

Self-Check Execise - 3

Briefly explain the feature of notation in DDC.

Note : i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this unit.

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13.4.4 Mnemonic Features

The term mnemonics stands for those symbols of notation which serves as aids to the memory. These symbols represent the same idea, whenever it appears. Dewey also used mnemonics at several places in DDC, representing the same meaning. Dr. S.R. Ranganathan, has identified four types of mnemonics, which are generally used in many scheme of classification.

(a) Alphabetical mnemonics
(b) Schedules mnemonics
(c) Systematic mnemonics
(d) Seminal mnemonics

In DDC 19, the first three kinds of mnemonics are used widely.

(a) Alphabetical Mnemonics

In the scheme, the alphabetical mnemonics are employed not only in schedules but also in tables. Some of the places where the use of alphabetical device is provided for in DDC is given below. For example,

329. 1-329.9 Political parties & specific countries

329.54 CON Congress party of India.

In the above example, the name of the party is got by Alphabetical device, by use of one, or two or three letters of the party.

(b) Scheduled Mnemonics

In DDC the scheduled mnemonics have been incorporated in the form of parallel schedules at many places and also in tables. These have been given in the form of 'Add' notation. For example,

312.260481 Statistics of deaths caused due to Gynecological diseases.

Add to 312. 2604 the number following 61 in 616-618 where the number for Gynecology is 618.1.

(c) Systematic mnemonics

The Canon of Systematic Mnemonics enuciated by S.R. Ranganathan prescribes that "in a scheme of classification the digits used to represent the array isolate ideas in an array should run parallel to the sequence in which the priciniples for helpful sequence would arrange the array isolate ideas". The application of scheduled mnemonics helps in attaining consistence in the order of subjects. For instance,

590 Zoological sciences

591 Zoology

592 Invertebrates

593 Protozoa & other simple animals

594 Mollusca

595 Other invertebrates

596 Chordata

597 Cold-blooded vertebrates

598 Aves (birds)

599 Mammalia (mammals)

It can be said that the above schedule zoology satisfies the canon of systematic mnemonics as it has been constructed conforming to the principle of later-in-evolution.

Self-Check Execise - 4

What type of mnemonic devices are employed in DDC?

Note : i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this unit.

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13.4.5 Tables

In the 19th edition we find the following seven tables:

Table 1	Standard subdivisions
Table 2	Areas
Table 3	Sub-divisions of individual literatures
Table 4	Sub-divisions of individual languages
Table 5	Racial, ethnic, national groups
Table 6	Languages
Table 7	Persons

The notation given in these tables is never used independently and they must always be attached to the number taken from the schedules.

(i) Table -1 : Standard Sub-divisions

Notation of this table, can be added directly to any number from the schedules or with the introduction of additional zeroes, provided the zeroes are not reserved for any class or general works. The notation may consist of two or more digits of which the first is 0, e.g. -05 stands for serial publications. ; 07-for study & teaching etc. These standard sub-divisions may be added to the notation taken or divided from the schedules. For example,

605 Serials on Applied sciences (Main class 6 plus standard and sub division-05)

(ii) Table-2 : Areas

This table contributes the largest part of the volume. This table gives the notation for various Geographical locations and physiological conditions of the world.

-4	European continent
- 44	France
-45	Italy
- 5	Asian continent and so on.

These notations may be added either directly when so instructed, or with the appropriate standard subdivision -09 for areas:

327.54	International relations of India (where - 54 stands for India from Areas Table-2)
330.954	Economic situation in India (where India - 54 is added with standard subdivision - 09 to base number 33)

(iii) Table-3: Subdivisions of Individual Literatures

This notation may be added to the main class of specific literature number 810-890 marked with asterisk (*). These terms are important common auxiliaries relating to the literature discipline. For example:

-1	Poetry
-2	Drama
-3	Fiction etc.

The above notation may be added to any specific literature, e.g. Telugu poetry 894.8271 (where 894.827 stands for Telugu Literature).

(iv) Table-4 : Sub-divisions of Individual Languages

Like, Table -3, the digit of this notation may be added to the numbers of specific languages, 410-490, which has been marked by asterisk (*).

-15 Phonology

-152 Spelling and Pronunciation

When we add them to any specific language class e.g.

English Phonology 421. 5 (-15 stands for phonology)

(v) Table-5: Racial, Ethnic and National Groups

The notation may be used when required with any number of the Schedule. The table enumerates the notations for different races, ethnical and national groups of different people in the world. Generally, most of the notations are extracted from the language notation. For example,

-1 North Americans

- 11 Canadians

- 31 Germans etc.

(vi) Table-6 : Languages

The use of this table is restricted only to those numbers from the schedules and other tables wherein the classifier is specifically instructed. The numbers in this table are a repetition, as they have already been given in class 400 languages and 800 literature. In their pattern 2 or 21 used for English Language ; 3 or 31 is used for the German Language etc.

(vii) Table-7 : Persons

This table introduced in the 18th edition used notations to denote persons based on their individual personalities, like social and economic status, occupation and professions; physical and mental characteristics etc. The notations of these are divided from the main class number

330	Economics	-33	Economics
340	Law	-34	Lawyers etc.

These notation can be added either directly, or on the basis of instruction or with standard subdivision -024 specific types of users.

Economics for Lawyers

e.g. 33 0.24 34

- 34 → Lawyers (from Persons Table-7)
- 33 → Economics (main class)
- 0.24 → Standard Subdivision (Table - 1)

However, tables 1,2,5 and 7 can be used as required with appropriate number from the schedules. They are applicable to the entire range of class numbers 000-999. The notation of table-6 'Languages' is also applicable, but their use is restricted to these numbers from the schedules and other tables wherein the classifier is specifically instructed. The notation of tables 3 and 4 are applicable only to their respective classes, literature and languages.

13.4.6 Summaries

The three summaries provided at the end of volume 1 give an outline of the schedules of volume 2. These summaries illustrate how the universe of knowledge is divided in DDC, the total number of main classes and their subdivisions. These summaries act as a guide for understanding the specific division of volume 2 and are of help for the beginner.

Self-Check Execise-5

What are the different tables given in DDC to synthesize the number?

Note : i) Write your answer in the space given below.

ii) Compare your answer with the model answer given at the end of this unit.

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13.4.7 Relative Index

This forms vol.3 of the DDC. The index contains an entry for every significant term named in the schedules and tables. It also included many aspects that are named or implied by add notes. Class numbers are given for most subjects that are in schedules and for many subjects whose numbers are obtained through number building.

The index is considered as a very important part of work, as it is the least of the scheme from the beginning. The index is considered as 'relative index' because of its inverse relations to the schedules. The relative index supplement the classification scheme by bringing to gether those related aspects of a subject which are scattered throughout the scheme due to classification by discipline. For example, if the classifier has a work on copper and if he looks under the term, he will find many aspects and sub-aspects of copper in various disciplines. Each aspect of copper leading to one or more specific precise numbers in the schedules. The index is very detailed in giving, under each subject, the numbers in which it may be classed according to the discipline or aspect or point of view treated in a given document.

Self-Check Execise-6

What is relative index?

Note : i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this unit.

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13.4.8 Synthetic Devices

DDC offers many devices for synthesis of class numbers. These may be categorised into the following types:

(i) Add from tables

(ii) Add from schedules

(iii) Add from both tables and schedules

(iv) Special topics of General applicability

(i) Add from tables

Notations from tables 2-7 may be added to certain numbers in the schedules to make them more specific under certain scheduled numbers. Instructions indicate exactly what may be added, from which table, to what base number. For example under 331.291-331.299, Geographical treatment (of wages) where appears the instruction "Add ' Areas' notation 1-9 from table 2, to base number 331.29". This means that for a book on 'Wages of India', the number -54 for India from table -2 is to be attached to the base number 331.29, which means wages in different countries. This results 331.29 54 where - 54 stands for India from table -2.

(ii) Add from schedules

Similar to above, the base number is always stated in the instruction to create a sequence by adding digits from another sequence in the schedule. For example, under 581.19 Biophysics and bio-chemistry (of Plants), the instruction reads as 'add to base number 581.19, the number following 574.19 in 574.191-574.192' eg. enzymes 581.1925.

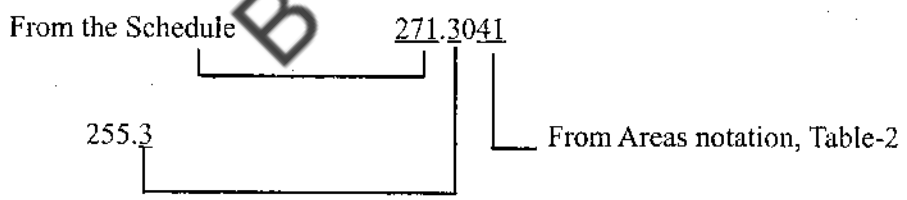
Sometimes, a complete class number is added to another class number. eg., under 026 special libraries, the instruction reads as "Add 001-999 to base number 026". Sometimes, in each class number two or more 'add' numbers may be present.

(iii) Add from tables and schedules

Sometimes numbers are derived by adding from table and then from the schedule or *vice versa*. For Example:

271 Religious congregations orders in church history

Add to base number 271 the numbers following 255 in 255.01-255.98 eg., Franciscans on church history 271.3; then add 0 and to the result add areas notation 1-9 from table 2' e.g. Francisans in U.K. 271.3041.



(iv) Special topics of General applicability

The principle of special topics of general applicability refers to the subdivision of a subject according to a characteristic having general applicability to its (subject's) subdivisions which are based on different characteristics.

For example, the subject Animal husbandry can be divided into specific activities like selection and acquisition, breeding, care and maintenance etc., (081-089), which are also applicable to any of the specific animals. Thus we have 636.1-9 various kinds of animals. The generalities like breeding (082) are applicable to any of the divisions from 636.1 to 636.9. Thus breeding of horses would be given the number 636.1082. This is achieved through an add to instruction.

Self-Check Execise-7

Briefly explain the devices available to synthesise the number.

Note : i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this unit.

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13.5 FACET STRUCTURE

Library classification, being a pre-coordinate system, has a fixed citation order for the various facets in a number. Even though the order is fixed, taking into consideration, the circumstances and the interests of the majority of the users, there may arise, occasions where those prescribed order of citation is not found satisfactory. For example in 340 law, where the division is considered to consist three elements (facets) apart from the base number 34:

(i) The branch of Law

(ii) Topics within the branch and

(iii) Geographical area

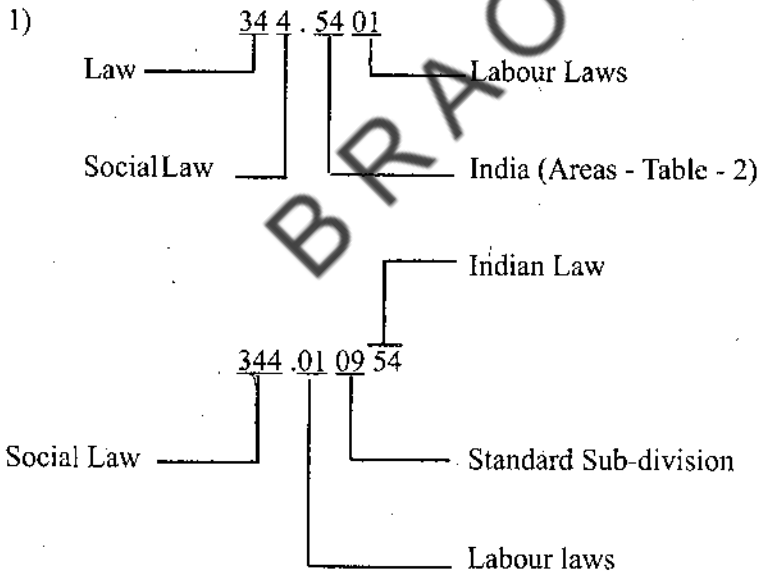
DDC provides a facet structure for arrangement in any of the three ways, as an option, viz,

a) branch of law, area, topic or

b) branch of law, topic, area.

If we take a specific title, "Labour Laws in India", pertains to a specific geographical area, following are the optional numbers for the title in question.

1)



13.6 MERITS

Usefullness : The important feature of the DDC is that its notation which provides a universal language, that can be understood in all libraries, and even in all countries, as it is used 1-9 Indo - Arabic numbers.

Versatility and Flexibility: Another valuable features of Dewey is the adaptability of its notation to the needs of libraries of different sizes and natures. This is a small or a large library can reduce the length of base numbers, according to its versatility. For example, a book on Diseases of wheat crops, can be reduced to the minimum base of 3 digits 633. If one needs it can also be extendable according to size and nature of the library collection.

Alphabetical arrangement : DDC has greater advantage of using the alphabetical arrangement for the terms of schedules and tables, at hierarchy at every stage, in the relative Index.

13.7 DEMERITS

Besides the number of merits, listed above, Dewey is also criticised for some demerits. As we know well, that DDC has come when no scheme was available. The major objectives of the DDC has been its practicality. Dewey was aware of the theoretical shortcomings but preferred practical usefulness to philosophic theory. Every scheme, at present has both merits and demerits. So, the DDC also is not an exception to it.

(a) *Order of classes :* DDC is criticised still on the order of classes of knowledge in the scheme. The sequence of main classes and the collocation of other sub-divisions are considered to be arbitrary and illogical. A few are:

(i) Separation of Languages (400) from Literature (800)

(ii) Social Sciences (300 from Geography & History (900)

(iii) Political Science (320) from Public Administration (350)

(iv) Commerce (380) from Economics (330) and Business management (650)

(v) Sociology (301-307) from Customs (390) and Social Welfare (360) and so on.

(b) *Anglo - American Bias :* The Scheme reflects an overwhelming Anglo-American bias in culture, language, literature, religion as the scheme was originated from America. For example in 200 Religion all the classes 200-280 has been occupied by christianity. The other major religions have been left with only 290-299.

13.8 SUMMING UP

DDC was first designed in the 1876 by Melvil Dewey with 42 pages. As we have seen in the evolution of DDC, the innovative ideas like relative location, decimal fraction notation, relative index and detailed classification of subjects contributed to the success of DDC. Despite its enumerative structure, the scheme has incorporated synthetic devices whenever possible.

The 19th edition of DDC was brought out in the year 1979, continued in the development of three previous editions. DDC being an enumerative classification, divides the universe of knowledge into ten main classes which is further divided into divisions and each division is continued till the desired degree of specificity is reached.

The DDC is a set of three volumes:

Volume 1 Introduction and tables;

Volume 2 Schedules; and

Volume 3 Relative index.

The seven tables act as common auxiliaries which are repetitive or commonly applicable to all classes.

The notation of the DDC is simple and often mnemonic. Relative Index of DDC helps the classifier to locate the given topic in the schedule and tables. It brings all the related terms of the subject at one place scattered in the schedules. DDC has its own merits to shelve the documents on racks in the libraries in a helpful sequence.

13.9 MODEL ANSWERS

1. It was published in four volumes. Volume-One: Introduction and tables: Volume-Two : Summaries and Schedules (000-599); Volume - Three : Schedules (600-999); and Volume - Four : Relative Index and Manual.
2. It divides the knowledge into ten main classes and each main class into ten divisions, each division into ten sections and so on. Therefore it is possible to extend the printed scheme at any point to any desired extent.
3. DDC is a best example for the pure notation, where Dewey used only single species of numerals to represent notation. He used the Indo-Arabic numerals 0,1-9 to represent the main classes and the divisions also by numerals. It is simple to understand and expand the number to any extent.
4. In addition to schedules, Dewey used seven common auxiliary tables to extend the number through synthesis.

Table -1	Standard subdivisions
Table -2	Areas
Table - 3	Subdivisions of Individual literatures
Table -4	Subdivisions of Individual languages
Table - 5	Racial, ethnic, national groups
Table -6	Languages
Table-7	Persons.

5. An alphabetic index to a classification scheme in which all relationships and aspects of the subject are brought together under each index entry.
6. To reduce the volume of DDC, said to be enumerative scheme, Dewey has introduced a few tables which led to synthesise the number. These synthetic devices may be categorised as :
   i) Add from tables;
   ii) Add from schedules;
   iii) Add from both tables and schedules; and
   iv) Special topics of general applicability.

13.10 ASSIGNMENTS

1) When was the first edition of DDC published?
2) What is an enumerative scheme for classification? How does it differ from Analytico-Synthetic Scheme?
3) What is meant by 'Add Note'?
4) Explain the 'Hierarchical Structure" of classes in DDC.
5) What is meant by 'Base Number'?
6) What do you mean by 'Phoenix Schedule'?
7) What are the various memory aids available in DDC?
8) What is meant by 'Decimal Classification'? Explain with examples.
9) Define 'Relative Index' and explain its advantages.

13.11 RECOMMENDED BOOKS

Dewey, Melvil. *Dewey Decimal Classification and Relative Index.* 19th ed/edited by Benjamin A Custer. vol.1: Introduction and Tables. New York: Forest Press, 1979.

Raju, A.A.N. *Decimal, Universal Decimal and Colon Classification: a study in comparison,* Delhi : Ajanta Publications, 1984.

13.12 GLOSSARY

Add Note : An instruction directing the addition to a designed base number of digits derived either from a number sequence in the schedules or from a table. Replaccdthe former instruction "divide like".

Artificial Digit : A letter or other symbol used in certain cases as a substitute for digits 0-9 to provide a more prominent location or shorter notation for various languages, literatures, religions, cultures, ethnic groups etc.

Base Number : (1) In a sequence of numbers, that portion which does not vary but remains the same in each number of the sequence. To this number digits from the tables or from another sequence in the schedules may be added asinstructed (2) The unvarying portion of sequence from which digits are taken to form another sequence may also be referred to as a base number.

Central Entry : An array representing a concept for which there is no specific number in the hierarchy of notation, and which therefore, covers a span of numbers.

Citation order : The order in which the classifier should take account of the subdivisions of a subject that is divided by more than one characteristic.

Divide - LIke : (Obsolete) An instruction to develop a span of numbers like another sequence by using same pattern of terminal digits. Superseded by add note (q.v.)

Hierarchy : The arrangement of disciplines and subjects in an order ranging from the most general to the most specific. In DDC degree of specificity is usually indicated by length of notation and always by depth of indention.

Instruction note : A note directing the user to take some specific steps which are not obvious from the heading and its context or from the general notes.

Memory aid : Any of various methods of using the same combination of numbers to represent the same topic in various contexts.

Optional Provision : A variation from the preferred provision offered to users in the printed schedules and tables of the DDC.

Phoenix Schedule : A completely new development of the schedule for a specific discipline. Only the basic number for the discipline is certain to remain the same as in previous editions, all other numbers being freely reused to the extent required.

Relativity : The property of the index which reverses the subordination of subject to discipline, thus bringing together from all disciplines the various aspects of individual subjects.

Schedules : The series of numbers constituting the notation for the ten main DDC classes and all their sub-divisions. Formerly called general tablels or tables.

Special topic of general applicability : A kind of subdivision of a subject or discipline which also a part of different kind of subdivision of the subject or discipline.

13.13 MODEL EXAMINATION

I. ESSAY QUESTIONS

1) Trace the evolution of Dewey Decimal classification upto the latest edition.

2) Explain briefly the salient features of the DDC with special emphasis on the latest edition.

II. SHORT NOTES

a) Standard subdivisions

b) Relative Index

UNIT - 14 : UNIVERSAL DECIMAL CLASSIFICATION (UDC)

Contents

14.0 AIMS AND OBJECTIVES

Universal Decimal Classification (UDC) is also a popular scheme of library classification and is in use throughout the world. The unit gives you an outline of the Scheme.

After going through this Unit, you will be able to

- assess the suitability of Universal Decimal Classification for classifying books and developing bibliographic tools like catalogues and indexes;
- listout various types of auxiliaries employed in UDC; and
- discuss its suitability for classifying microdocuments.

14.1 INTRODUCTION

Universal Decimal Classification is generally considered as the first faceted scheme of classification to be developed. It is a scheme for classifying information on all subjects and in all forms. The medium editions contain about a one-thirds of the material of full editions.

In this unit the Universal Decimal Classification is explained with reference to its structure, notation, auxiliaries, synthetic devices and alphabetical index. The unit briefly describes its origin and development and discusses its strength and weakness. Further, it also provides you adequate guidance to build a number of your own. A few worked out examples have been demonstrated for building the number.

For building numbers, you are advised to use a copy of UDC schedules, published by the British Standards Institutions under the title *UDC : International Medium Edition English Text (BS 1000 M : 1985)* : 2 volumes. This comprises two parts.

Part 1 : Systematic Tables (BS 1000 M : 1985)

Part 2 : Alphabetic Subject Index (BS 1000 M : 1988)

14.2 HISTORICAL BACKGROUND

Universal Decimal Classification has its roots from Dewey Decimal Classification. The Dewey Decimal Classification attracted the attention of Paul Otlet, a young Belgian Barrister, already noted for his work in 'Bibliography' in the Social Sciences. This was in 1895, when Otlet, in collaboration with Henri La Fontaine, was working on a universal bibliography under the auspicious of Institute International de Bibliographie (IIB) in Brussels. Both were working on the Project Universal Bibliographic Repertory, which was intended to become a comprehensive classified index to all published information.

While Otlet was in search of a means for arranging the entries of the planned Universal bibliography he found that Dewey Decimal Classification which was in its 5th edition, was found most useful for the purpose. Therefore, he obtained permission to translate it into French. Otlet and La Fontaine were impressed by the following merits of Dewey Decimal Classification:

(i) As a taxonomy of human knowledge which can be expressed in an international language.

(ii) Due to the decimal numbers it can readily accommodate the details needed for bibliographic classification.

However, Otlet was not satisfied with just borrowing the Dewey Decimal Classification text and translating it into French. Several innovations were introduced into the original scheme to develop a versatile means of arranging and retrieving literature. Thus:

1. Universal Decimal Classification became a highly synthetic scheme.
2. Various possible relations between subjects were identified and symbols assigned to represent them.
3. Realised that characteristics common to many subjects listed separately as Tables of common auxiliaries.

With the introduction of auxiliaries and other synthetic features, Universal Decimal Classification achieved a higher level of detail in numbers and economy of presentation. The level of detail worked out by Otlet and La Fontaine in the French version of Dewey Decimal Classification due to their innovations served well the purpose of their Repertory. This contains 33,000 sub-divisions and was published by IIB in French during 1904 to 1907, naming as *Handbook to the Universal Bibliographic Repertory.* It was in fact the first edition of Universal Decimal Classification.

14.2.1 Various types of Editions

This edition led to the publication of various editions in different versions of the language. English, French and German have been chosen as the official languages for the maintenance of Universal Decimal Classification. IIB started to publish Universal Decimal Classification in the above versions.

The scheme of the first French edition was continued to expand and work progressed to the 2nd edition under editorialship of Frits Donker Duyvis. He is responsible for the extension and revision of the Science and Technology (S&T) sections. The 2nd of French edition was published during 1927-33 increasing the subdivisions to 70,000; 3rd edition in 1934-1951, raising the subdivisions to 1,40,000.

The credit for introducing and popularising Universal Decimal Classification in the UK and from there to the Commonwealth countries goes to Dr. S.C. Bradford (1878 - 1948) a pioneer in the field of documentation. The first edition in English was in fact third edition of the Universal Decimal Classification and was published in the year 1936 under title Classification for works on pure and applied science in the Science Museum Library. The responsibility for publishing a Full Edition of Universal Decimal Classification in English was initially taken by the British Society for International Bibliography and the ASLIB together and several other parts were published during 1936-39. Later, BSI assured the responsibility for publishing Universal Decimal Classification and continued to produce English editions as BS1000 from 1943. The latest in the series of publications is BS 1000 M: 1985 Universal Decimal Classification - International Medium Edition. The index was published as BS 1000 M: 1988, an alphabetical Subject Index.

In due course the British Standard Institution became the official British editors body and publication of the full English edition, the 4th began in 1943.

Two other methods of publications are used, the Medium edition and Abridged edition. The first medium edition was published in German. The first British abridged edition was published in 1948 and was based on the Science Museum schedule. The second edition 1957 was more detailed. The latest abridgement is the 3rd edition published in 1961 covering 30% of the full edition.

Decision was taken to publish Basic Medium Edition known as the "International Medium Edition". International Medium Edition in German appeared in 1980. In English the first part was published in 1985 and the 2nd part of the Universal Decimal Classification was published in 1988, under the name of BS 1000 M (London : BSI). The second edition to this was came out in the year 1993. It is also available in the electronic from. The electronic UDC is accompanied by two guides. One is a manual explaining how to use the file and a guide to the ways in which the file can be put to use. Apart from the above Special Subject Editions were brought in some of the subjects like Nuclear Science, Mining, Metallurgy and Building.

14.2.2 Revision and Updating of UDC

The overall control on the development, revision and updating of UDC is vested with Central Classification Committee of FID i.e. FID/CCC, consisting of FID Secretary General and editors of full editions of UDC. The proposal for the revision or extension of UDC generally comes from the users. A proposal can be forwarded to the FID office at Hague through the national committee or by individual users after it was first considered by the editors. The proposals are then sent to headquarters for a careful study and after it is accepted, it will be published as 'P-note'. These proposals will be kept open for a period of four months and any user of UDC may comment on them. If no comments are received within the stipulated time, the proposals will be accepted and included as a part of UDC schedules. Every year p-notes are progressively cumulated into three-year volumes.

The process of revision of UDC is very long and it takes nearly two to ten years for accepting a proposal and by that time the proposed alternations in some of the fast growing disciplines like sciences and technologies may become out dated.

FID is the Center for Management and Maintenance of Universal Decimal Classification. Universal Decimal Classification has been translated into many other languages and there are now editions of various lengths in 23 different languages.

A related advantages of UDC lies in its independence. It is therefore possible to use UDC class marks as a complement to post - coordinate indexing language techniques, to represent subject concepts, to act as theasuraofacet or to display hierarchical structures. As the automation held great promises for UDC, it is most suitable general scheme for retrieval of information in electronic files. Thus, UDC may be a way to make more suitable for the online age without drastic structural revisions to the existing UDC.

Self-Check Exercise - 1

State Briefly the genesis of Universal Decimal Classification.

Note : i) Give your answer in the space provided below.

ii) Compare your answer with the model answers given at the end of this unit.

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14.3 NATURE AND STRUCTURE

14.3.1 Nature

Classification is a means of bringing order to multiplicity of concepts, or perceptions or items of information, by arranging them into classes. The classification may be special, biased towards a particular subject or general covering the universe of information. The UDC and DDC both are the examples for general classification. The classification may also be scientific or documentary. Again, DDC and UDC are documentary, as they tend to be either for library use or bibliographic collection. The Classification may also be enumerative or faceted/analytico -synthetic. Therefore the UDC has all the characteristics of general, documentary and faceted.

14.3.2 Structure

As the Universal Decimal Classification has qualities of general, documentary, and faceted the scheme has been divided into two kinds of tables, the Main and the auxiliary tables (sometimes called as "schedules" and "tables" respectively.)

The scheme begins with a contents table, brief introduction, which includes a brief historical outline and describes the scheme as it is to-day.

The auxiliaries which will be described in detail, appear next, followed by an outline of the main tables. The overall outline of the main table is similar to that of DDC but the notation is slightly different and the lay out is rather less satisfactory. There is no three figure minimum in UDC, so Science is 5, Mathematics 51. In order to break-up the notation, which tends to be rather long, a point is used after every three digits as 621.039.5, if no other notational device is applicable.

14.3.3 Main Tables

The UDC is closely related to DDC. As in Dewey's scheme the Universe of Knowledge was divided in 10 classes, each of which then further divided by ten as:

0 Generalities: science of knowledge, organisation, information etc.

1 Philosophy, psychology.

2 Religion, Theology

3 Social Science, economics, law, Government education, commerce.

4 Vacant

5 Mathematics and natural sciences.

6 Applied Sciences, Medicine, Technology, Agriculture

7 The arts, recreation entertainment, sport

8 Language, linguistics, literature

9 Geography, biography, history

The class 4 was cancelled in 1963 to make room for future development, and its subjects, linguistics, was merged into class 8 Literature.

Each of these broadest classes, is denoted by a single digit Arabic number, divided further as ten and then further by ten and so on, for eg. class 5 is divided into the following subclasses.

50 Generalities

51 Mathematics

52. Astronomy, Astrophysics, space research, geodesy

53 Physics

54 Chemistry, mineralogical sciences

55 Earth science, geology, mineralogy etc.,

56 Palaeontology

57 Biological sciences in general

58 Botany

59 Zoology

These two digit classes have further subdivisions, denoted by three-digit numbers and so on. The main tables are divided hierarchically with the numeric hierarchy reflecting the conceptual hierarchy.

61 Medical Sciences

611 Anatomy

612 Physiology

613 Hygiene personally

614 Public Health

614.1 Population. Depopulation

614.2 Public and Professional organ of Health

614.3 Sanitary Inspection & Control

615 Pharmacology, Therapeutics, Toxicology

616 Pathology, clinical medicine

617 Surgery, orthopaedics, ophthalmology

618 Gynaecology, obstetrics.

619 Veterinary science.

We can see ourselves how in the above example numeric hierarchy reflects the conceptual hierarchy. Each broad classification is divided into narrow classes by adding a digit and similarly each narrow class so gotten into still narrow ten classes, the same way until no further sub-divisions are possible. By short-listing our example the two hierarchies, numeric and conceptual, will be self-evident. Thus.

3	Social sciences
35	Public administration
355	Military Affairs generally
355.2	Recruitment of Forces
355.21	Personnel
355.211	Systems of recruitment
355.211.3	Reserve Forces

We moved down the numeric hierarchy from 3 (the broadest class) to 355.211.3 (the narrowest class) by adding one digit at a time, six times in all. Similarly, with every division, we moved down the conceptual hierarchy from Social Sciences to Reserve Forces studied in Military Affairs under Public Administration, a social science from the broadest concept to the narrowest. This means the main tables are divided by hierarchy.

The division of the UDC, thus follows the principle of general to special. In the hierarchy that each class gets divided super-ordinate, by denoting greater extention, the co-ordinate devoting a similar level of generality and the subordinate, denoting greater specificity or intension.

Self-Check Exercise-2

State Briefly in what respect UDC differs from DC

Note : i) Give your answer in the space provided below.

ii) Compare your answer with the model answers given at the end of this unit.

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14.3.4 Auxiliary Tables

The auxiliaries are infact a set of common facets and facet indicators which enable us to synthesize freely. Some of them are of fairly restricted application while others may be used frequently.

The UDC has developed two kinds of auxiliaries.

i) Common auxiliaries; and (ii) Special auxiliaries.

The common auxiliaries which may be used at any point in the main schedules and the special auiliaries which have different meanings according to their context.

These auxiliaries are considered as the UDC's most innovated and influential feature. It is with the help of these auxiliary notations that the signs and sub-divisions provided to allow for the construction of compound numbers or synthesis. A compound number is created by synthesizing, using elements from more than one place in the tables.

For example :	159.92	is a simple number
	327 (410)	is a compound number
	327 + 34	is formed due to synthesis

The simple number above is taken from Psychology table denoting compartive Psychology where as 327 (410) is a compound number as two elements, 327 Foreign Relations and (410) United Kingdom are taken from two separate tables, viz., Political science and common auxiliaries table - d. The second number represents synthesis and similiarly 327 + 34 (Foreign relations and Law) formed due to synthesis is also a compound number.

(A) Common Auxiliaries

The common auxiliaries denote generally recurrent characteristics, those that are applicable through out the main tables. The common auxiliaries are denoted by two types of symbols: the signs and sub-divisions.

The signs serve as relators to link UDC numbers between two numbers. The accepted signs are the plus, the stroke, the square brackets and double colon, which bring relationship together in the compound concept.

The plus and the stroke represent kinds of *aggregation;* while the colon serves for most other relations.

For example:

+ plus meaning And	327 + 34	International relations and Law.
/ stroke meaning To	1/2	Philosophy to Religion

: colon meaning reversible relation

32 : 34 Political Science in relation to law or

34:32 Law in relation to political science.

[ ] Square bracket meaning, algebraic subgrouping as understood in algebra.

(35 + 34) (540) Publication Administration and Law in India.

: Double colon meaning Irreversible relation

77.044 : : 355 War photography

since it is irreversible, it cann't be 355:77.044

Therefore, these signs act as relators that link UDC numbers and they are not by themselves numbers. These do not represent classes and cannot be subdivided.

In the above example 327 (Foreign Relations) and 34 (Law), the plus sign connects the related subjects, but nonconsecutive numbers. The stroke connects consecutive numbers e.g. 1 (philosophy) and 2 (religion). Therefore 11/14 means 11+12+13....14. The colon indicates relation between two co-ordinate classes, as in 35:34, where the meaning does not change even if the order of the classes in it is reversed. The square brackets are an algebraic subgrouping device to denote a complex subject formed by two or more main numbers with a plus sign or colon. The double colon fixes the order of the component numbers in a compound number. Thus 77.044 : : 355 war photography, where 77.044 news photography and 355 is war, can only be placed under news photography and not under war because the number is not reversible.

Auxiliary Sub-divisions

The common auxiliary tables consist of numeric tables. In this the concepts are enumerated and arranged hierarchically. Though they resemble the main tables, they are distinguished by their own symbols. These symbols are prefixed to the number, or they enclose the number. These common auxiliaries are featured recurring in all or most subjects. They are listed only

once in the scheme in order that they may be taken out and attached where they are required. The common auxiliary subdivisions, thus, facilitate synthesis and create mnemonics.

The common auxiliary subdivisions fall into two groups : (i) the independent, (ii) and the dependent auxiliary tables. Both are affixed to any UDC number and where appropriate the independent auxiliary subdivisions are used of their own, to form the whole class number for a document. For example, tables of language, form, place etc., The dependent auxiliary tables are always affixed to a UDC Numbers. For e.g., persons, materials and point of view etc.

As Independent		**As Dependent**
Language	= 20 English	point of view
Form	(031) Encyclopedias	.001.5 Research
Place	(41) Great Britian	e.g. Research in
Time	"1990"	Library Science 02.001.5
Race & Nationality	(=96) Negroes	Persons 055.2
		Women professionals
		in Library Science 02.055.2
		Materials - 037 Yarn.

The above tables show most of independent auxiliary subdivisions tables have symbols that enclose the number as in parenthesis, quotation marks etc. where the dependent auxiliary tables have the symbols used as suffixes, with dot, dash etc.,

As seen above the common auxiliary subdivisions are grouped into two as, (i) independent and (ii) dependent. The tables of (i) language, (ii) form, (iii) place, (iv) race, and (v) time. The dependent common auxiliaries are the auxiliaries of (i) point of view, (ii) material, and (iii) personal.

I. The Independent Common Auxiliaries

(i) Common Auxiliaries of Language

These auxiliaries denote the language or linguistic form of a document whose subject is denoted by a main UDC number. The symbol used to represent as common auxiliary of language is (equals). The language number may be formed on the basis of parallelled division of 802/809 individual languages and 820/899 "Literatures of Individual Languages" Thus a detailed table was given in 1(c) of UDC (B 1000M: 1985)

= 20 English from 820, by substituting = (equals) sign in the place of '8'.

For example : 54=20 Textbook of Chemistry in English.

53 (035) =20=30 Handbook of Physics in English / French.

(ii) Common Auxiliaries of Form

These denote the documentary form or representation of a subject represented by a main UDC number. The symbol used to represent the form is (0...) zero in parentheses.

58 (035) Handbook of Botany

58 (048.7) Summaries on Botany.

(iii) Common Auxiliaries of Place

The place auxiliaries indicate the geographical range, locality or other spatial aspect of a subject denoted by main UDC number. These can be represented as (1/9) brackets one-to-nine.

eg. 331.2 (44) Wages in Frnace

331.2 (44-17) Wages in Northern part of India.

(iv) Common Auxiliaries of Race and Nationality

These denote the nationality of ethnic aspects of a subject represented by a UDC number. These will be represented by a symbol (=....) brackets equals)

39 (=96) Folklore of Negroes.

(v) Common Auxiliaries of Time

These denote the date, point of time or range of time or subject represented by a main UDC number. The symbol used to represent time element is " " (double quotation marks). Apart from the double quotation marks the time auxiliaries employ the plus and minus signs (for BC and AD)

"1991"	Year 1991
"1991.12.11"	Eleventh December 1991
"18"	19th Century.

II. The Dependent Common Auxiliaries:

(i) Common Auxiliaries of point of view

These denote the most general points of view form which a subject may be considered: concept, theory, function, activity, process etc. These are applicable throughout UDC, by suffixing, directing the main numbers. These are not to be used independently. The symbol used to represent this element is 00.... (point nought nought)

e.g. 02.001.5 Research in library science,

622.002.5 Plant, Machinery equipment in Mining.

(ii) Common Auxiliaries of materials

The symbol used to represent the element is -03 (hyphen nought three). These denote the materials or constituents of which objects or products are made, and are applicable through most of the main tables if the materials aspect is secondary to the subject. The main places for the materials are in most cases the sections of 66/67 dealing with manufacture of processing.

666.3/.7-033.57 Enamel in ceramics.

where - 033.57 represents Enamel.

(iii) Common Auxiliaries of Persons

The symbol used to denote the auxiliary is -05 (hyphen nought five). The -5 auxiliaries denote the persons concerned or their characteristic or discipline according to personal application.

294.5-05	Hindus
33-05	Economics

At any place in the above hierarchical chain any new concept can be accommodated without disturbing the order of existing concepts. The division on the basis of decreasing extension clearly expresses the order of classes in the hierarchy.

(B) Special Auxiliaries

The special auxiliaries, unlike common auxiliaries are not listed in one place, and by definition (i.e. denotes locally recurrent characteristics) that are applicable in an united range of main subjects. They occur at various places in the main tables, and express concepts that are recurrent, but in a more limited subject range. Most of the special auxiliaries are enumerative and listed in the class. They are always listed on suffixes to other main table numbers and cannot be used independently and they are applicable only where they are indicated. The same

notation indicated may be used elsewhere with a different meaning attached to it.

Of the notation used in special auxiliaries, the three main kinds are described and differentiated in auxiliaries tables:

(i) **The Hyphen series :** -1/-9 serving to indicate elements, components, properties and other details of the subject denoted by the main number to which they apply.

For example: The series 62-1/-9 applicable throughout 62/629, denotes Engineering and its sub-classes.

(ii) **The Point-nought series :** .01/.09 denoting the sets and subjects of recurring concepts such as aspect studies, activities, processes, operations, plants and equipment.

For example : 629.02.07 equipment, instruments etc. of transport vehicle Engineering.

(iii) **The Apostrophe series:** '1/'9 unlike hyphen and point nought series, these are synthetic and integrative in function and denote compound subject by compound notation. They are sometimes fully listed, but elsewhere are derived from main numbers of parallel division.

For example : Subdivision of 329 Political parties.

329.17'23'12 Nationalist-Republican-Liberal parties. (Is a synthesis of 329.17-329.23 and 329.12)

669.15'24'26-194 Low-carbon alloys of steel, nickel and chromium

Where 669.15-194 Low carbon ferrous alloys

669.24 chromium

669.26 nickel - steel

The special auxiliaries may be used singly or in combination with other auxiliaries and the special auxiliaries may also occur more than once, in a class.

e.g. 329.052 Opposition parties

329.052'23 Republican party as opposition party.

Self-Check Exercise-3

What are auxiliaries available in UDC and state their use.

Note : i) Give your answer in the space provided below.

ii) Compare your answer with the model answers given at the end of this unit.

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14.3.5 Parallel Division

The parallel division is signalled in the table as sign ≅ This simply means the number preceding the ≅ may be subdivided in a manner analogous to the number following it and this will be exactly an analogous array with the same concepts expressed by the same sequence of digits.

Target Number			Source Number	
611	Anatomy	~ =	616	Pathology
611.11/.14	Cardiovascular System Blood vessels, etc., under Anatomy	~ =	616.11/.14	Diseases of Cardiovascular System, Blood vessels, etc. (under Pathology)
611.11	Pericardium		616.11	Diseases of Pericardium
611.12	Heart		616.12	Diseases of Heart
611.13	Arteries		616.13	Diseases of Arteries
611.14	Veins		616.14	Diseases of Veins

In this case the subdivisions of 616 are the source numbers from which digits have been taken and added to the target number under 611 expressing the same concepts i.e. the left hand column represents these items in the context of Anatomy, while those in the right hand represent them in the context of Pathology. It means in 611 'Anatomy', parts of which are parallel to 616 'Pathology', where both are subdivided into particular organ.

Here the compiler has opted to give more details under 'Pathology', but it would not matter which was chosen as the main place. The point is that they are parallel and to enumerate the organ fully in both places would be a waste of effort. Therefore, at such place, the compiler instructs the classifier with parallel sign. For example under

611.1 Angiology, Cardio-Vascular System, Blood vessels:

611.11/.14 ~ = 616.11/.14

In the above case the 616.1 subdivisions are the source numbers from which the digits may be detached and added to the target numbers under 611; thus 616.12 is analogous to 611.12

14.4 NOTATION

You already know that notation is a code representing the concepts of classification scheme and generally expressing their order. The UDC has the following set of symbols:

i) The ten Indo-Arabic numerals : 0, 1 to 9

ii) The Roman alphabet, both capital and lower case

iii) Punctuation marks like point, semicolon, colon and inverted commas

iv) Mathematical signs: the plus and the euqals.

Besides it included parentheses, square brackets, stroke and apostrophe.

The UDC used the above notational symbols, for representing different aspects. The numerals are used to provide the whole of human knowledge into 10 broadest classes, each of which has been further divided to form 10 theoretical classes and so on, as shown in the section 14.3 structure.

14.4.1 Notational Symbols

(i) Roman letters are used in such places where the subject can be better indentified by their use, for example, in the class Literature. The punctuation marks and mathematical signs are used as connecting symbols to build compound numbers by adding to the base numbers from the auxiliary tables. The numbers carry ordinal value and not arithmetical value, meaning they are decimal fractions and not integers. This facilitates division of a class at any point in the order without disturbing it. The other qualities of UDC notation are explained in the following subsections.

14.4.2 Hospitality

The UDC notation consists of numbers which are taken as decimal fractions, therefore it can accommodate emerging new ideas, at any place, where appropriate. The same procedure also followed as in the case of auxiliaries as well. The notation is thus hospitable and capable of reaching the required level of detail. Since it is hierearchical moving from the general to the particular, it expresses the oder of classes. For e.g.

3	Social sciences
33	Economics
331	Labour Economics
331.2	Wages
331.22	Payment System
331.225	Bonus system

14.4.3 Facetisation and Synthesis

The editors of UDC claim that the scheme is faceted. Every recurrent category is a facet and the best example of facetisation is presented by its tables of common auxiliaries. The UDC's citation order for facets is flexible to a great extent, as evident from the examples given our discussion on common auxiliaries in sub-section 14.3.3. (sub-divisions). It also uses a device called intercalation to change as required, the citation order of facets with a view of creating a more helpful sequences (see 14.4.4). The UDC is therefore, a faceted classification.

It is also a highly synthetic scheme. Ordinarily, every faceted scheme is synthetic in structure. However, in addition to facetisation in the form of common auxiliary subdivisions, UDC also contains a number of other synthetic devices such as:

1. The usage of signs (+, /, : :) to connect two or more numbers.
2. The use of apostrophe (') in special auxiliaries.
3. The facility to combine in a single number, two special auxiliaries.

In short, if the main tables of UDC display its hierarchical enumerative character, the auxiliary tables represent its faceted and synthetic structure.

Self-Check Exercise-4

What is the Notational system in UDC?

Note : i) Give your answer in the space provided below.

ii) Compare your answer with the model answers given at the end of this unit.

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14.4.4 Intercalation

Generally the ciation order is fixed to use the auxiliaries with main table numbers. Intercalation is the use of an auxiliary as an infix, rather than a prefix or suffix. In other words, certain auxiliaries may interrupt a main number. This at times, becomes necessary to provide an alternative approach. For example:

378	Higher Education
378 (540)	Higher Education in India
378.18 (540)	Student life in India
378.4	University
378.4(540)	Indian Universities

In the above arrangement the books about Higher education in India get scattered throughout the class Higher Education. Ideally, if required, all books on Higher Education in India should be brought together.

It is possible to bring together, if the auxiliary number for 'place' in the above case is used as an infix and allowed to interrupt the main number as follows:

378

378(540)

378 (540).18

378 (540).4

If we want to be more helpful, it might to brought still forward to precede the Higher Education.

378

37 (540) 8

37 (540). 18

37 (540) 8.4

14.4.5 Mnemonics

Mnemonics results from the use of same notation representing a given concept wherever that concept occurs in the scheme. The common auxiliary divisions and the parallel divisions are the two principal mnemonic devices used in UDC. Both these devices have been discussed in detail in sub-section of 14.3.3 and 14.3.5

14.4.6 Citation Order

The Citation Order is also otherwise called as Facet Formula (like in Colon Classification). Citation order means the order in which the elements are combined to make a compound number. Each element in the citation represents a facet in the subject. In simple words, the citation order is the reverse of the filing order. This means, the sequence proceeds from special to general. The order is as follows:

Main Class	Special auxiliaries	Point of view	place	time	form	language
0/9	.0	.001/.009	(0/9)	" "	(0)	= ...
	-0/-9					
	'1/'9					

It is suggested that the above standard citation order may not be satisfactory in all cases. The reason would be the need in particular collection, to bring together (to collocate) all references to a particular aspect of a subject, which would be separated if the standard order were followed. Therefore the citation order is optional.

14.4.7 Filing Order

The filing order of UDC symbols is based on a progression from the general to the particular. Thus, a common auxiliary used as independent number is filed before a main number. This is followed by a compound number having the plus sign or the stroke, in it, as it is broader in meaning than a simple number. Next, the simple numbers are filed in the order of increasing length. The length indicates specificity (due to an auxiliary) or particularity (due to hierarchical division). The filing order of UDC notation is given on page xi of the International Medium Edition - English text (BS 1000 M: 1985)

14.4.8 Evaluation

The UDC notation is hospitable and expressive. It is basically enumerative, moving from the general to the particular, and contains synthetic devices. As a result, the numbers are at times very long. A scheme that attempts to attain the required degree of detail for bibliographic purposes and computerisation is bound to produce long numbers with a host of symbols. The notation has achieved the necessary specificity and particularity, but in the process, has become clumsy. The common auxiliary subdivisions and parallel divisions lend mnemonic character to the notation, and above all the device of interaction brings flexibility in facet order to make it versatile.

14.5 INDEX

The Part - II of UDC is the Index published in the year 1988, as BS 1000 M Part 2 : 1988. The Index has been prepared through the computer by permuting the terms available in Part I. Necessary care is taken while generating the entries in Index to reflect the wording in the tables. The arrangement of entries is alphabetical, word by word. Spaced initials filed at the beginning of a letter sequence. For example, the entry E.N.T. (Ear, Nose, Throat) forms the first entry in the letter sequence of 'E' and unspaced letter - word starting with 'Ent...' field as word, which may come after abbreviations.

E.N.T. (Ear, Nose, Throat)	616.2
Earth Closets	628.42
East Africa	(67)
Ebonite	678.44
....	
....	
Employment	331
Engineers, Industry	62.007.1
Ententents *See* Alliances	
Enteric Fever	616.927
Enterology	616.34
.... and so on.	

14.6 PROVISION FOR FUTURE EXPANSION

As we have seen, the UDC notation is decimal and can accommodate emerging new concepts wherever necessary. In addition to this to build provision, UDC has resorted to what is called 'gap device'. These gaps in the notation are meant for accommodating a large number of subdivisions and are left where future expansion is envisaged. We found the following vacant numbers in the notation:

004	In fundamentals of knowledge and culture
149/159.8	In philosophy and psychology
305/307/309	In social sciences
365/367	In social welfare
375	In Education
38/388	In social sciences
4	The class philology is referred to 8 Literature.
503/509	In Pure Sciences
525/529	In Astronomy
538.1/538.8	In Physics
544/545	In Chemistry
6/607	In Technology
695	In Building construction.

14.7 UPDATING

The responsibility for maintenance and updating of UDC lies with FID/CCC. The FID/CCC works in conjuction with national organisations having consultative arrangements with users of the scheme. Suggestions for revision normally come from users who find that schedules in particular subject are inadequate for their needs, either through lack of detail or addition of new subjects. A draft will be prepared for such things and set to FID/CCC for detailed study and approval. If it is satisfactory, they publish as P-Notes every year. P- Notes which have been accepted and entered are cumulated into the *Extensions and Corrections to the UDC*. It is the responsibility of user libraries to carry out the amendments appearing in this periodical to enusure uptodatedness.

14.8 MERITS AND DEMERITS

As we are aware that UDC is designed on the basis of DDC, is certainly has certain merits to its credit. The main objective of designing the scheme is for classifying information on all subjects and in all forms. It is worth while to understand the merits of UDC.

1. The UDC is a general scheme of classification, enumerating the entire universe of information. The knowledge is divided so as to achieve the required specificity. The required specificity is also arrived with the help of common and special auxiliaries.
2. The notation consists of numerals and signs, which are understood internationally. It allows the maximum hospitality for admitting new terms, because of the decimal notation.
3. As already explained, that the UDC is a faceted / analytico-synthetic classification for connecting various citations in one single class.
4. It is extremely flexible, at it can be used for any type of library. The citation order helps the classifier, to arrange the documents according to his needs. He can also, make use of the technique of Intercalation if he needs.
5. It is ideally suitable for special libraries as its full edition contains specific subject schedules of minute description. The medium edition takes care of almost all subjects.

14.9 SUMMING UP

The UDC is claimed by its editors, as an analytico-synthetic classification with the added advantrage of flexibilities in the citation order for facets. The flexibility in the citation order is due to the provision of devices of intercalation and reversible relation. UDC includes two kinds of tables, main and auxiliary, where the former represents its enumerative character and the latter lends its analytico-synthetic character. The degree of detail achieved by UDC through hierarchical enumeration in the main tables, and through facetisation with the help of auxiliaries makes it a truly bibliographic classification. The notation in UDC is hospitable, expressive, and highly synthetic. It also contains several mnemonic devices. UDC is an international effort and caters to the universal needs. It is suitable for general and special collection. Although UDC orginates from DDC and inherits some of its drawbacks, its merits easily outweigh them. Hence, it has become popular with science/special libraries through out the world.

14.10 PRACTICAL EXAMPLES IN UDC

The following are some worked out examples :

1. Foreign Policy of India and France

Foreign Policy	327
India (54)	
France	(44)
Synthesized number	327 (54:44)

2. Technical Russian Dictionary on organic chemistry

Organic chemistry	547
Dictionary (subject)	(038)
Russian language	= 82
Synthesized number	547 (038) = 82

3. Administrative procedures of Armed services recruitment systems

Armed services recruitment	355.211
Administrative procedure	35.077.3
Synthesized Number	355.211.077.3

Where. 077.3 is special auxiliary

4. Nomadic cultures of Gypsies of Spain

Nomadic culture	903`15
Spain	(460)
Gypsies	(=914.99)
Synthesized number	903`15 (=914.99) (460)

5. Human rights of disabled children

Human rights	342.7
Disabled children	- 56.266-053.2
Synthesized number	342.7-56.266-053.2

6. Educational Guidance in Turkey

Educational Guidance	37.04
Turkey	(496.1)
Synthesized number	37.04 (496.1)

14.11 MODEL ANSWERS

1. UDC has its roots in DDC.UDC was designed by two Belgians; Paul Ottlelt and Henry La Fontaine under the aegis of the newly founded Institute International de Bibliographic at Brussels. Otlet was working on a universal bibliography and he is in search of a means for arranging the entries of the planned Universal Bibliography and found the DDC (5th ed) most useful for the purpose. Due to some reasons the work was stopped and the idea passed to design a scheme which may be helpful for classifying all types of published works. The first French edition was published during the years 1901 - 1907

2. UDC has derived from DDC and in many respects, both are identical, for example hierarchical enumeration. Besides common auxiliaries, UDC has also developed special auxiliaries. Because of several connective devices. It has become synthetic to a very great extent. UDC has also identified several relations between subjects. UDC has a higher capacity with regard to specificity because of facetization in it. This is how UDC is different from DDC.

3. Two types of auxiliaries are available in UDC : (i) Special auxiliaries, and (ii) Common auxiliaries. The special auxiliaries are locally recurrent characteristics in nature, and are available in various places of the main schedules. These concepts are applicable to those subjects under which they are so listed and their use is restricted to those subjects or their sub-divisions only. Where as common auxiliaries are attachable to any class, having repetitive and recurrent characteristic values.

   The available common auxiliaries in UDC are :

   i) Common auxiliaries of language
   ii) Common auxiliaries of form
   iii) Common auxiliaries of time
   iv) Common auxiliaries of place
   v) Common auxiliaries of point of view
   vi) Common auxiliaries of races, national groups.

4. UDC Notation consists of the following symbols.

   i) the Indo-Arabic numerals : 0, 1 to 9
   ii) The Roman alphabet, both capital and lower case
   iii) Punctuation marks like point, semi-colon, and inverted commas.
   iv) Mathematical signs, the plus and the equals
   v) Besides the above, it also includes, parenthesis, square brackets, stroke and apostrophe.

   The Qualities of Notation:

   i) Notation is decimal, therefore highly hospitable
   ii) It is based on hierarchical enumeration, the relation is expressive.
   iii) It contains a number of synthetic devices and capable of alternative approaches.
   iv) Finally, it is simple and amenable to computerization.

14.12 ASSIGNMENTS

1) Give a brief note about the structure of UDC.

2) What are the various connecting symbols used in UDC?

3) Give reasons to call UDC as faceted classification.

4) Give a brief account of synthesis in UDC.

5) Briefly list out the features of UDC (IME), 1985.

14.13 RECOMMENDED BOOKS

Raju, A.A.N. *Decimal, Universal Decimal and Colon Classification : a study in comparison.* Delhi : Ajanta Publications, 1984.

Raju, A.A.N. *UDC (IME 1985) : a Practical and Self-Instructional Manual.* Madras : T.R. Publications, 1991.

UDC International Medium Edition - English Text (BSI 1000 M : 1985). London : BSI, 1985. Introduction (Part-I)

UDC International Medium Edition - English Text (BSI 1000 M : 1988). London : BSI, 1988, Index (Part-II)

14.14 GLOSSARY

Citation Order : The order in which the facets are cited in a number.

Conceptual hierarchy : The division of a generic concept into a chain of subordinate concepts, e.g. classification to decimal classification UDC (See also numeric hierarchy.)

Dependent auxiliary : A common auxiliary in UDC so called because it can appear only in conjunction with a main number, e.g. point of view materials, persons.

Generally recurrent : Features common to all subjects e.g. form, languages etc. Common auxiliaries listed only once.

Independent auxiliary : A common auxiliary in UDC that may be used as a class number also. For example, it is possible to build a collection of Area Studies by starting the number with the relevant space number. Here, the space facet is an independent auxiliary.

Interacalation : The device that facilitates infixing.

Irreversible relation : The relation that cannot be reversed. The relation that does not allow permutation of the concepts in a compound number

Locally Recurrent : Features special to certain subjects only and not applicable to all, e.g. personnel in industry and the like. They are listed where applicable in the scheme.

Numeric hierarchy : The hierarchy expressible numerically. The quality possesed by an expressive notation, e.g. 6, 62,621 etc. Technology to engineering to mechanical to Electrical Engineering.

Parallel division : When the same set of concepts appears at two places, or under two classes, in a classification, these conceptsare listed only once and reference is made to them from the other place where they are to be represented in the similar fashion. These two divisions under two classes are parallel to each other.

Reversible relation : The relation that can be reversed. The two elements in a compound number in a classification can be permuted or rotated, if the relation between them is reversible.

Specificity : Akin to particularity. If particularity is achieved through enumeration, specificity is achieved through synthesis. The capability of classification to represent all elements in a subject.

Thesaurus : A Structured list of terms usually pertaining to a narrower subject area. The list also displays, besidesinterrelationships, preferences among terms. Each theasurus forms an indexing language relevant to a given field.

14.15 MODEL EXAMINATION QUESTIONS

I. ESSAY QUESTIONS

1) Trace the origin and development of Universal Decimal classification.

2) Briefly explain the structure and features of Universal Decimal Classification with special emphasis on International Medium Edition.

II. SHORT NOTES

a) Notation in UDC

b) P - Note

UNIT - 15 : COLON CLASSIFICATION (CC)

Contents

15.0 AIMS AND OBJECTIVES

Colon Classification is one of the most important schemes of library classification. This Unit helps to familiarise you with the Scheme and its principles.

After going through this Unit you will be able to :

- describe the origin and development of CC;
- explain the features of different editions of CC;
- grasp the basic postulates and principles underlying CC ;
- discuss the concept of facet analysis and fundamental categories; and
- acquaint yourself with various techniques and devices employed in CC.

15.1 INTRODUCTION

Colon Classification is the best example of Analytico-Synthetic Classification scheme. S.R. Ranganathan has designed it, to meet the challenges of ever growing knowledge and to make it possible to classify all types of documents, with certain underlying principles. Unlike DDC and UDC, the scheme is based on sound theory. The scheme is planned in such a way to accommodate a new subject without disturbing the arrays already formed and at an appropriate place.

15.2 GENESIS OF CC

Dr. S.R. Ranganathan was born in 1982, at Shiyali, Tanjore District in Tamil Nadu. He was basically a teacher in Mathematics. His interest towards books and librarianship made him to become the Librarian of the Madras University Library in 1924. Soon after his appointment, he was deputed to Britain for an observational tour of British Libraries. While on tour, he also attended a few classes in the School of Librarianship, University of London. During his observational tours he visited many libraries and found lacunae in existing schemes of classification in use then. He thought of designing a better scheme of classification which may help to classify all types of documents. While in search of methodology, once he happened to visit a departmental store in London where he found a clue for evolving a scheme of classification. He observed a demonstration of a toy called Meccano set. The meccano set consists of several slotted strips, rods, wheels, screws, nuts and bolts with which several models can be made. This gave him an idea to connect different isolate ideas of a basic subject by a connecting symbol and he selected colon as a connecting symbol.

He started working on designing a scheme of classification. In 1925, he returned to India and completed the scheme in 1932. The first edition was published in 1933.

Self - Check Exercise-1

a) Why did Ranganathan call Colon Classification a s'Analytico-Synthetic Scheme for classification?

Note : i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this unit

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b) What made S.R. Ranganathan to design Colon Classification?

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15.3 EDITIONS OF CC

15.3.1 First Edition

The first edition of CC was published in the year 1933 with three parts. Part 1: 127 pages of rules explaining the underlying principles; Part - II : 175 pages of schedules and Part - III : 106 pages of Index. The notation used was mixed and the colon (:) was used as the connecting symbol for joining the facets. For easy understanding each main class is provided a facet formula.

The first edition was designed as the trial and error effort. Actually, there was no underlying principles in which the schedules and facets were based. Therefore, after 1933, he tried to evolved a theory of classification based on Colon Classification shceme. The result was the publication of *Prolegomena to Library Classification in 1937* based on this theory. The second edition of *Colon Classification* was published in 1939 with illustrative examples.

15.3.2 Subsequent Editions

From this S.R. Ranganathan, started productive research work for improving the colon classification scheme. After a lapse of 11 years, the 3rd edition of colon classification appeared in 1950 without any major modifications. A facet formula for each basic class was provided. The term facet replaced the phrase ' train of characteristics'. The fourth edition of CC has radical changes over its previous editions. It can be said a freely-faceted classification. Five indicator digits to indicate five fundamental categories were introduced. A number of Greek letters for partially comprehensive subjects were introduced.

Fundamental Category		Indicator Digit	
[P]	Personality	,	comma
[M]	Matter	;	semi-colon
[E]	Emergy	:	colon
[S]	Space	.	dot
[T]	Time	.	dot

The indicator digit for Time (.) was later changed to a single inverted comma (‘). This was the edition where S.R. Ranganathan recognised different facets.

The 5th edition of colon classification appeared in the year 1957. In this edition several changes and things were added. This edition allocated zones for different kinds of isolates. Further, S.R. Ranganathan described the postulational approach to classification and used (.) parentheses to represent the subject device. Many Greek letters were introduced to expand the base of main classes. Further 2nd level space and time isolates were also introduced.

The sixth edition was published in 1960 with the following modifications:

i) Greek letters which were introduced in Edition 5, were avoided except Δ and Σ

ii) Indicator digit (‘) inverted comma was used to represent Time facet.

iii) The concept of empty and emptying digits was evolved.

In 1963, the reprint of 6th edition was published with the following corrections and amendments :

i) ‘X’ was employed as emptying digit. Therefore the main class L, HZ and KZ has been renamed as LX, HX and KX.

ii) Evolved the methodology for designing a depth schedule on the basis of refined techniques and principles.

iii) Evolved the concept of 4 zones with 40 sectors.

Finally a thought was given to revise the scheme and publish in the form of depth-schedule. Based on this, a preview of CC7 was published in 1969 with many proposals and changes. Unfortunately, S.R. Ranganathan passed away in 1972 and the work was delayed. Finally, the long awaited CC7 with substantial changes from the earlier edtion appeared in 1987.

Self-Check Exercise-2

a) What are the Five Fundamental Categories (FFC)?

Note : i) Write your answer in the space given below.

ii) Compare your answer with the model answer given at the end of this unit.

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b) What are the connecting symbols used of FFC ?

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15.3.3 Features of Seventh Edition

The seventh edition published in 1987 is in five parts viz; Part-A : Introduction ; B : Guidance to the beginner; C : General Rules ; D: General Divisions and Common Isolates; and E : Special Isolates. One significant features of this edition is the provision of Environment Divisions and Common Property Isolates which are not found in the sixth edition of CC. The concept of fundamental category Matter has been changed. It may manifest itself among the facets of a compound subject as Round1, Round 2 and so on, let it Matter - Method (M-Me), or Matter - Property (M-P), Matter - Material (M-Mt). Consequent to this change the facet formula for example for Medicine now is : Medicine - Organ - Property - Action, i.e., L, [P]; [MP] : [E]. The common auxiliaries such as (ACI), (PCI) and common facets Space and Time have been greatly enlarged. There is no general index to the schedules.

15.4 BASIC PRINCIPLES

Colon Classification is a freely faceted scheme for classification. Like other schemes, the universe of classes is divided into main classes, each Main Class into facets and each facet into an array of isolates on the same subjects. Therefore there is a need to know the meaning for the terms main class, facet and array before we proceed.

Main Class

The classes are traditional subjects where the universe of subjects are divided into. These may also be otherwise called as basic subjects. Basic subjects may be simple, compound or complex subjects. e.g. Physics, Chemistry, Zoology, Botany, etc.

Array

Ranganathan defined an array as "the totality of the divisions on the basis of single train of charatacteristics is said to constitute an array". It means the systematic arrangement of number symbols in an orderly manner basing on the single characteristic. E.g. in Library Science (MC) different types of libraries represented under Personality Facet are :

World, National, Regional, State, Divisional, etc., which form a single array by classes.

Facet

Each main class is divided into facets to signify the whole series of arrays, based on a set of related characteristics of division. In the main class Library Science types of libraries have been constituted as a single facet. Each Main Class is divided on the basis of one or more trains of characteristics. The totality of the divisions of a basic class based on a single train of characteristics is said to form one of its Facets.

Ranganathan formed a number of postulates which may help in understanding the basic principles. Colon classification is based on postulates and principles. A postulate is a presumption or assumption. It is a basis for argument and hence one is not supposed to question the veracity of the assumption. Ranganathan enumerated the following postulates in colon classification.

i) Postulate of Fundamental Categories

ii) Postulate in Basic Facet

iii) Postulates in Isolate Facet

iv) Postulates in Rounds and Levels

v) Postulates in Facet Sequence

15.4.1 Postulate of Fundamental Categories

According to S.R. Ranganathan there are five and only five fundamental categories, namely Time, Space, Energy, Matter and Personality in any given subject. They also come in order of PMEST according to their decreasing concreteness. He further stated that a subject may be divided into only five fundamental categories. Some times it may be less in number, but not more than five.

Among all fundamental categories, Time and Space are self explanatory. They can easily be identified by their characteristics of time element or geographical element. For example, 'Conditions in China during 19th century'. We can recognise 19th century as Time and China as Space.

Energy

After Time and Space, the next fundamental category is Energy. It refers to some type of action, problem, operation, process, method or technique. For example in Library Science, classification and cataloguing represent some action. In Agriculture, ploughing and harvesting represent again some action. Hence these may be indentified easily in any given subject.

Matter

Matter may manifest in the subject in three kinds, namely, Matter - Material (MMt), Matter - Porperty (MP) and Matter - Method (MMe). Matter facet can be recognised easily. It usually consists of material used in construction, consumption etc. It may take a variety of forms like wood, silk, plastic, etc.

In medicine disease, physiology etc., are treated as Matter - Property. In Analytical chemistry biological method, thermal method, etc., are treated as Matter - Method. In CC 6th edition Matter facet is available only in few subjects.

Personality

It is very difficult to define Personality. Therefore, Ranganathan found a way out to recognise Personality by the method of residues i.e. eliminating the other facets first in the order of Time. Space, Energy and Matter. Personality facet will remain as residue.

15.4.2 Postulates of Basic Facet

Every basic subject is formulated by the Fundamental Categories of PMEST and each basic subject has its own facet formula. Every compound subject has a basic facet i.e., a compound subject consists of a basic subject and one or more isolate ideas as its component. In other words, a basic facet traditionally stands for a Main Class. e.g. Psychology, Economics, History, etc., In colon classification we find the number of main classes is more than 47, in 7th edition they are still more. But we can't name all as main calsses. Some may be traditional classes or canonical classes which may have its own Facet formula to construct the class number. For e.g. C6 Electricity, where 6 is not a fundamental category, but it is a part of the basic class. Hence it needs a separate facet formula for it.

In many compound subjects the Basic Facet may be implicit or explicit. For example in a class History of Economics where Economics is a Basic Facet, is explicit; and in another class Diseases of Lungs, where BF Medicine is implicit.

15.4.3 Postulates of Isolate Facet

Each compound subject consists of certain isolate ideas. Therefore, each isolate facet of a compound subject can be deemed to be manifestation of one and only one of the FFC. Those isolate ideas, which occur as manifestation of fundamental categories like Time, Space, Energy and Matter are easy to recognise. The residue will be as personality.

For e.g. : Treatment of Diseases of stem of wheat plant in 1974 in Haryana

Agriculture (Basic Facet)

1974 (Time Facet)

Haryana (Space Facet)

Treatment (Energy Facet)

Disease (Energy Facet)

Stem (Personality Facet) (level 2)

Wheat Plant (Personality Facet) (level1)

15.4.4 Postulates of Rounds and Levels

It was found that some of the fundamental categories, [P], [M] and [E] may manifest more than once in a subject or within the round of the subject. This led to formulation of rounds and levels. These have to be easily understood by the way of postulates of rounds and levels. For example, 'Treatment of Lung Diseases by X-Ray therapy'. In this, treatment is [E], Lung [P], Disease [E], X-ray therapy [P]. Thus energy appears itself more than once in the same subject. Such manifestations are called rounds of manifestation.

'Personality' and 'Matter' may manifest itself more than once in one and the same round within a subject along with Energy facet. 'Space' and 'Time' manifest in the last round. The first manifestation of fundamental categories within a round is called level-1. Similarly, its several manifestations within the round is called level-2 and level-3 and so on.

For example in Literature, the facet formula is O[P], [P2] [P3], [P4], where the personality manifests more than once, within one and same round of the basic subject.

15.4.5. Postulates for Facet Sequence

Once the various facets occuring in a compound subject have been determined, the next step is to arrange these facets in a helpful sequence. The sequence of different kinds of facets of a compound subject are determined by the following postulates:

i) Postulate of first facet.

ii) Postulate of concreteness

iii) Postulate of facet sequence within a round

iv) Postulate of facet sequence within the last round

v) Postulate of level cluster.

The above postulates help to enable the classification to arrange a helpful sequence of different facets occuring in a compound subject.

Self-Check Exercise-3

Identify the fundamental categories from the following titles:

a) Reference service in academic libraries in India during 1990s.

b) Teaching of geography in secondary schools.

c) History of India.

d) Lung diseases among children.

Note : i) Write your answer the in space given below:

ii) Compare your answer with the model answer given at the end of this unit

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15.5 NOTATION

S.R. Ranganathan introduced three planes of work in his theory of classification (i) Idea Plane, (ii) Verebal Plane and (iii) Notational Plane. Of these, notational plane is beset with several problems. It is in this sphere that much research work has taken place and several innovations have been made. Ranganathan in the colon classification scheme used mixed notation, in which a class number may have two or more species of digits.

15.5.1 Types of Notational Symbols

The following notational symbols are used in colon classification.

1-9 Indo-Arabic numerals

A-Z Roman alphabets (both capitals and lower case a-z)

( ) Parantheses

Indicator digits

* Asterisk (indicates Agglomeration and Interpolation)

<- Backward arrow (indicates backward range)

" Double inverted comma (indicate common isolates)

& Ampersand (indicates phase relation)

' Single inverted commas (indicates Time facet)

. Dot (indicates Space facet)

: Colon (indicates Energy facet)

; Semi-colon (indicates Matter facet)

- Hyphen (indicates speciator of kind-1)

= Equal sign (indicates speciator of kind-2)

+ Plus sign (indicates and, addition

→ Forward arrow (indicates forward range)

Of these *, " , & =, + are introduced in the 7th edition.

These above notational symbols and digits used in the scheme have been given ordinal values for the arrangement in the Classification Number. The order is given in ascending value.

)&`.;:,-= a to z 01 to 9 A to Z * + "

15.5.2 Emptying Digit

An Empty digit is employed in colon classification to increase the capacity of an array. An empty digit can be employed as a sectorising digit and used to form sectors. Therefore, empty digit is defined as "a digit with ordinal value but without semantic value". Usually, the last digit of a species of digits can be postulated as an empty digit.

The digit z, 9 and Z have been postulated as empty digits. For example, if you are using the Indo-Arabic numerals, 1-9, you can divide it only upto nine places, and 10th and subsequent division cannot be accommodated. To overcome this difficulty, colon classification uses numerals 1 to 8 only and 9 is left as an empty digit. Actually, it has no value by itself, but regains its full value when it is used in combination with 91, 92, 93... 98 or 991, 992, 993 and so on. This method has given tremendous potential to increase the arrays in any given facet.

15.6 DEVICES

The main purpose of a device is to sharpen a facet number to form a new isolate. The devices help in shortening the schedules by avoiding enumeration. It also provides autonomy to the classifier when the new subjects crop-up. This requires formation of new isolates. The devices will make it possible to the classifier to achieve the above by sharpening the isolates with the help of devices. Besides, it also satisfies the conons for helpful sequence, mnemonics and hospitality in an array as well as in a chain.

Dr. Ranganathan provided a number of devices for this purpose. A few important devices are given below:

1. Chronological Device (CD)
2. Geographical Devices (GD)
3. Subject Device (SD)
4. Alphabetical Device (AD)

15.6.1 Chronological Device (CD)

The purpose of this device is to sharpen a facet number by employing a chronological number from the schedule of Time isolates. It can sharpen an isolate to form a new isolate. In Colon Classification the (CD) has beeen widely used at many places for shapening the isolate to form a new isolate.

(i) Authors in literature

O111,2M64

M64 is taken from Time Isolate, which stands for 1864 as [P3]

(ii) Religious sets in the schedule of Religion Q

e.g. Q29M8 where M8 stands for (CD)

(iii) Systems in Basic classes

LB Ayurveda, where B is (CD) and also used in many other places of the schedules.

15.6.2 Geographical Device (GD)

Similar to (CD), the (GD) is also used for the purpose to form or to sharpen an isolate number in a schedule. The Geographical Device is implemented by using a space isolate number from the schedule. The Geographical Device is also employed in colon classification at several places like Library Science, Fine Arts, Religion, Linguistics, History, Law and in several other main classes.

e.g Early Egyptian Religion for which the class number is Q8677.

Here Q8 is othes Religion; 677 Egypt from the schedule of space isolates.

It is also further used in the classes of

(i) Community in History and Law

Indian Law Z44, History of India V44.

(ii) Style in Fine Arts.

Indian Architecture NA44

Here 44 India

(iii) Other religions

e.g. Sikkim Q8441

Where 44 is India and 1 used for favoured Category Device (FCD). This device is used at several other places in CC.

18.6.3 Subject Device (SD)

Subject device is used to form or sharpen a facet by adding to it (facet) another class number from elsewhere in the scheme and the borrowed part is enclosed in circular brakcets or parentheses. The subject device is freely used in colon classification at several main classes to sharpen the isolates. For example:

1. Technical Libraries 24(F)

In the above example 24 stands for Business Libraries in the main Class LIbrary Science, where (F) Technology is added from the main class.

2. Teaching Classical Language T:3(P8)

Where (P8) is Classical Language got by (SD).

5.6.4 Alphabetical Device (AD)

Alphanetical Device is also used to form or sharpen an isolate number. The device is used taking first or first two or three letters of the names of persons or subjects or products widely accepted as such. The device is used as a last resort. CC permits the use of the Alphabetical device at a number of places. This is used to represent.

(i) Individualization of works of classical authors.

(ii) Brands of machine etc.

O157,3M61,G *Gora* (A novel by Rabindranath Tagore)

J381P *Parmal rice* (where J381 is rice and P for Parmal)

Self-Check Exercise-4

What are different devices employed in CC?

Note: i) Write your answer in the space given below.

ii) Compare your answer with the model answer given at the end of this unit.

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15.7 PHASE RELATIONS

Due to 'Information Explosion' new subjects are coming up at a faster pace. We come across several interdisciplinary subjects. It is generally due to the interaction between two or more subjects. The same is expressed as loose assemblage. Such subjects have to be assigned by correct class numbers. Therefore, Ranganathan recognised the concept of loose assemblage in relation to the universe of subjects. He introduced the concept "phase" to describe the relationship between the basic or compound subjects. It is called as phase relation. A phase relation may occur between two or more main classes. It may also occur within one and the same facet of the main class or within the isolates of the same array of the facet. These relations are called as Inter-subject and Intra-array phase relations.

1. General relation phase
2. Bias phase
3. Comparison phase
4. Difference phase
5. Tool phase
6. Influencing phase

In the 7th edition of CC the indicator digit (connecting symbol) between the class number and digit representing the phase relation is "&" (Ampersand). In the 6th edition it was 0. The following indicators are used in CC.

Kind of Phase relation	Inter-subject	Intra-facet	Intra-array
General	a	j	t
Bias	b	k	u
Comparison	c	m	v
Difference	d	n	w
Tool	e	p	x
Influencing	g	r	y

The following are the few examples to show the use of different kinds of phase relations in CC as per the 7th edition.

S.N.	Title	CC7	CC6
i)	General Study of Botany and Zoology (Type : Inter-subject; Kind : General Phase)	I&aK	10aK
ii)	Morphology biased to Physiology (Type : Intra-facet; Kind : Bias Phase)	L:2&k3	L:20k3
iii)	Aristocracy compared to middle class (Type : Intra-Array; Kind : Comparison)	Y52&v3	Y520v3
iv)	Influence of Buddhism on Christianity (Type : Intra-Facet; Kind : Influencing)	Q6&r4	Q60r4
v)	Application of Psychology to Education (Type : Inter-Subject; Kind : Tool Phase)	T&eS	T0eS
vi)	Difference between rural and city folk (Type : Intra-Array; Kind : Difference)	Y31&y5	Y310y5

Self-Check Exercise-4

What are different types of phase relations in CC?

Note: i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this unit.

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15.8 SYSTEMS AND SPECIALS

Till the 6th Edition of colon classification, systems and specials were enumerated along with main classes showing separately at the end of each main class schedule. The systems and specials are used in several classes, like Mathematics, Biology, Agriculture, Medicine, Education etc.

(a) Systems

Colon Classification (CC) incorporates schools of thought in certain subjects. The schools of thought are later termed as systems. For example, under Education, Montessori approach;

under Economics, Marxist approach are systems. All the system isolates in a basic class are given the notational digits according to the Chronological Device (CD). The time of the origin of the system is the characteristic used for it.

For Example,	in X Economics :
XA	Systems
XB	War economics (originated between 9999 to 1000 B.C.)
XM	Co-operation (originated in the 19th Century)
XN1	Syndicalism (originated in the 1916); and so on.

In the above, X is Economics and B, M and N1 are formulated on the basis of Chronological Device, from the table of Time isolates.

(b) Specials

It denotes a division of main class in which the subject of study is restricted to attributes of the core entity under the subject of study. In CC the digits in sectors (S-9A) to (S-9K) are used for representing the Specials. Therefore, the class numbers of specials are derived by enumeration by AD. Some of the examples of special subjects under the subject of study are:

L-90 Adolescent medicine	E-9G Bio-Chemistry
J-9B Dry Farming	S-9X Industrial Psychology

Self-Check Exercise-6

How have Systems and Specials been treated in CC?

Note i) Write your answer in the space given below:

ii) Compare your answer with the model answer given at the end of this Unit.

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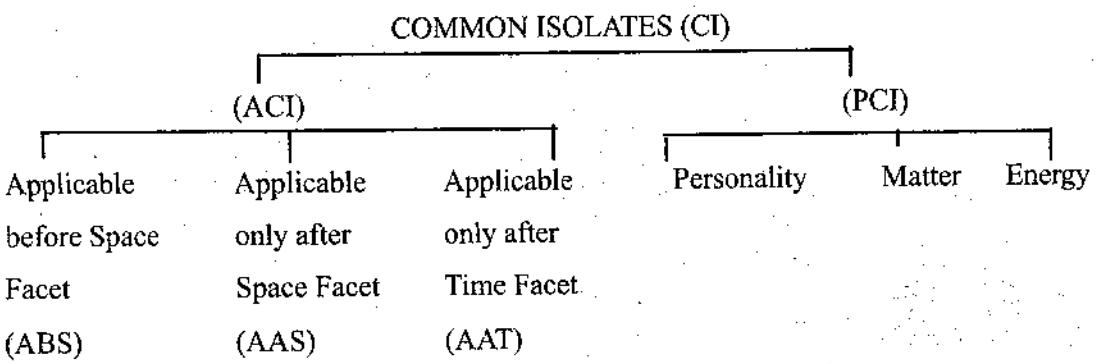
15.9 COMMON ISOLATES

In Colon Classification (6th Edition) we find two types of Common Isolates, viz., Anteriorising Common Isolates (ACI) and Posteriorising Common Isolates (PCI). The following chart will give you a clear idea about various types of (ACI) and (PCI):



The following worked out examples will demonstrate the use of these various types of Common Isolates.

1. (ACI) Applicable Before Space Facet

(i) Bibliography of literature Oa

(ii) Shakespeare Concordance O111, 2J64c

(iii) Herald of Library Science, (1990), 2m44,N9

2. (ACI) Applicable only after Space Facet

(i) Indian Education Statistics, (1974) T44sN74

(ii) Administration Report of National Chemical Laboratory (1990) Pune, E.44,f,N50rN90.

(iii) Administration report of Central Mechanical Engineering Research Institute (1958), Durgapur for 1990. D6.44,f,N58rN90.

3. (ACI) Applicable only after Time Facet

(i) Report the Advisory committee for Libraries appointed by Government of India; (1959). 22.44`N59t.

(ii) Statistics (stray) of University Librarians in India, (1990). 234.44`N90s

(iii) Source material for Social Science Research in India, (1991). Σ:f.44`N91v

4. (PCI) Energy Common Isolates

(i) Critical study of Tagore works O157,1M61:g

(ii) Designing Library Classification 2:51:b2

(iii) Experiments in Physics C:f3

5. (PCI) Personality Common Isolates

(i) Functions of the President of Andhra Pradesh Library Association (Estd. 1914) 2.4416,9N14,1:3

(ii) Report of the Functions of the Vice-Chancellor of Osmania University for 1990. T4.4416, e4, O, 12:3`N90r

(iii) Report of the Director of National Physical Laboratory (Estd. 1950) for 1990. C.44,f,9N50,1`N90r

6. (PCI) Matter Property Isolates

Material Common Isolates have not been listed in the 6th edition of CC. However, these have been provided in the 7th edition of CC (1987). These have been named as Common Property isolates (Chapter DL). The following are some of the worked out examples :

(i) Physical properties in plastic works Mg;c2

(ii) Hardness in toy making M06; cF1

(iii) Orange colour binding M18; cR8h

15.10 SPACE AND TIME ISOLATES

In addition to the above variety of (ACI) and (PCI) the fundamental categories Space and Time function as Common Facets. The isolates listed under Space and Time can be attached to any subject. After Common Isolates, CC provides for Time and Space Isolates which are the manifestation of the fundamental categories Space and Time. Time occurs in many subjects

forming a local description or local history of particular period. Its isolates represent the characteristics of time such as millennium, century, decade, year, month etc.[T1] and day, night, seasons, weather conditions, etc. [T2]. In CC all these isolates have been listed as levels of manifestation of Time i.e. [T] and [T2].

Space isolates or geographical divisions can be used in all the subjects to represent local description and history in the class number. The space isolates represent geographical divisions like continents, countries, districts; water formations like, sea, oceans and rivers; physical features like deserts, mountains, plateau and population clusters like, village, town and city. All these isolate ideas are listed under [S] and [S2]. The following are some of the worked out examples using Space and Time Isolates.

1. Rainfall in Hyderabad city during winter 1990: U2855.4416H`N90`n7
2. Agriculture in Godavari Valley in 1990s : J.441.16G`N9
3. Skating Alps in summer 1990 : MY2545.2A'N90'n3
4. Incidence of Asthama in Madras city in winter 1990 : L44:453.4411M`N90`n7
5. Flora and Fauna of Himalayas : G:12.4.2H

15.11 THE INDEX

The general index to the schedule in CC is entirely a tool for the classifier and not for the user. It is an index to the fundamental constitutent terms in the schedules of classification and the relative aspects of a subject are given only in the form of class numbers not being shown the relative aspects as in DDC. It has been explained that the first letter or digit represents a common isolate if it is a lower case and main class if it is a numeral or a capital letter. If the number begins with a capital letter followed by a numeral, it is the number of a canonical class. The following is an extract from the index of CC.

Step D[P],5[P2],61

-	daughter	R4[P],2258
-	father	R4[P],2214
-	mother	R4[P],2218
-	son	R4[P],2254

Self-Check Exercise-7

What is a Common Isolate ? List out different types of Common Isolates.

Note: i) Write your answer in the space given below:

ii) Compaare your answer with the model answer given at the end of the unit.

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15.12 MERITS AND DEMERITS

Merits : Because of sound theory, principles, canons and the provision of hospitable notation and several devices CC is capable of assigning a unique class number for almost every subject. The systematic order of main classes and the degree of detail and the provision of analysis and synthesis are great virtues of CC.

Demerits : The drawback of CC is its complexity in assigning class number for the titles and there is no permanent machinery to keep the scheme upto date, as in the case of UDC and DDC. The guidance provided in the recently published 7th edition is not enough and lacks clarity and clearcut rules. It calls for a manual, with numerous worked out examples for its application for classyfying various types of documents.

15.13 PRACTICAL WORK IN CC6

i) Cataloguing of manuscripts in Special Libraries in India.

24;12:551.44

Where:	Library Science	(BC)	2
	Special Library	[P]	4
	Manuscripts [M]	12	
	Cataloguing [E]	55	
	India	[S]	44

ii) Fungus Diseasses of Leaves of insectivorious plants

19597,15:433

Where:	Botany	(BC)	1
	Insectivorous Plants	[P]	9597
	Leaf	[P2]	15
	Disease	[E]	4
	Fungus (Disease)	[2P]	33

iii) Harvesting of Rice in Tamilnadu during 1985

J381:7.4411'N85

Where	Agriculture	(BC)	J
	Rice	[P]	381
	Harvest	[E]	7
	Tamilnadu	[S]	4411
	1985	[T]	N85

iv) Control of Floods in Ganges

Y: 4355:5.P1G

Where	Sociology	(BC)	Y
	Flood	[E]	4355
	Control	[2E]	5
	Ganges (River)	[S2]	P1G

v) Direct Taxes in India X72.44

Where	Economics	(BC)	X
	Direct Taxes	[P]	72
	India	[S]	44

vi) Adult Education in Africa T3.6

	Education	(BC)	T
	Adult	[P]	3
	Africa	[S]	6

15.14 SUMMING UP

With all its merits, Colon Classification is the best example for freely faceted or analytico-synthetic scheme for classification. It has well developed theoretical foundation with numerous postulates and principles. The concept of five fundamental categories i.e., PMEST, is the basis for analysis of the subject, and synthesizing a class number on the basis of facet sequences.

To achieve coextensive class number, a number of principles have been worked out for the facet sequence and helpful sequence and devices - chronological, geographical, subject, alphabetical etc., are used in CC for forming new isolates or sharpening the existing isolates. The CC is more hospitable to new subjects through zone analysis, and employed the concepts of empty and emptying digits. It is one of the best examples of freely faceted schedules for library classificaation.

15.15 MODEL ANSWERS

1) (a) A scheme which gives the classifier the maximum autonomy in constructing the numbers for new specific subjects not enumerated in the schedules. Ranganathan's colon classificaaation was the first scheme of this kind. The scheme is also known as freely-faceted classification.

(b) Dr. S.R. Ranganathan, thought to design a better scheme of classification, which may help to classify all types of documents. While in search of the methodology, once he happend to visit a departmental store in London and found a clue for evolving a scheme of classification. He observed a demonstration of toy called meccano set. This has given him an idea to design scheme on the principle of combining the various facets.

2) (a) The five fundamental categories are Personality, Matter, Energy, Space and Time (PMEST)

(b) In the notational plane, the FFC have been given the following connecting symbols :

[P]	,	Cama
[M]	;	Semicolon
[E]	:	Colon
[S]	.	Dot
[T]	`	Inverted cama

3) a) Library Science Basic class

Academic libraries	Personality
India	Space
1990s	Time
Reference service	Energy

b)

Education	Basic Class
Secondary schools	[P]
Teaching	[E]
Geography	[2P]

c)

History	Basic Class
India	[P]

d)	Medicine	Basic Class
	Child	Special
	Lung	[P]
	Diseases	[E]

4) CC has employed the following devices to sharpen the isolates.

i)	Chronological Device	(CD)
ii)	Geographical Device	(GD)
iii)	Alphabetical Device	(AD)
iv)	Subject Device	(SD)
v)	Super-Imposition Device	(SID)

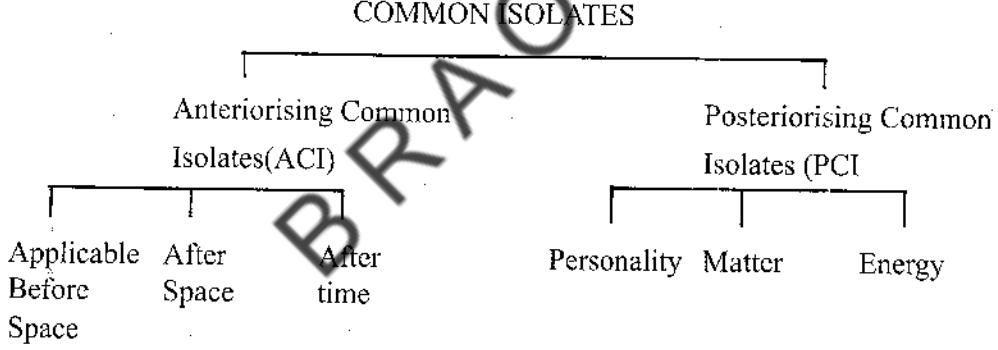
5) The following are the relations used in phase:

Intra Facet and Intra array;

i) General ii) Bias iii) Comparison iv) Difference v)Tool, and vi) Influencing.

6) Systems have been treated by sharpening the isolates with Chronological Device and Specials by Alphabetical Device, preceding with '9' to denote the specialisation, in the subjects.

7) Common isolate is an isolate, which can be attachable to many classes. Ranganathan divided Common Isolates in the following manner based on their occurence:



15.16 ASSIGNMENTS

1) Colon Classification is a analytico-synthetic scheme of classification - Discuss.

2) What are the various postulates employed in CC?

3) What is the notational structure in CC?

4) What is a mixed notation? What symbols are used in CC?

5) What is the use of devices in CC?

6) Give a few examples of systems and specials and state in which they are found.

7) Enumeratte different types of common isolates.

15.17 RECOMMENDED BOOKS

Foskett, A.C. *The Subject approach to information.* 4th ed. London: Clive Bingley, 1982.

Raju, A.A.N. *Decimal, Universal Decimal and Colon Classification: a study in comparison.* Delhi: Ajanta Publications, 1984.

Ranganathan, S.R. *Colon Classification.* 6th ed. Bombay: Asia Publishing House, 1963.

Ranganathan, S.R. IN *Encyclopaedia of Library and Information Science.* Vol.5. New York: Marcel Dekker. P.216-240.

Ranganathan, S.R. *Prolegomena to Library Classification.* 3rd ed. Bombay: Asia Publishing Housse, 1967 (Reprint by Bangalore: UBS Publishers, 1990).

15.18 GLOSSARY

Analytico-synthetic : A scheme of classification based on the analysis of a subject into different facets. The facets are arranged by the prescribed postulates and the facet terms replaced by facet numbers. The facet numbers are finally synthesised into class numbers with the aid of appropriate connecting symbols.

Anteriorising Value : The value that enables the number possessing it to precede other numbers.

Array : A set of numbers displayed in a row or column derived from the application of a single characteristic.

Basic facet : The main class or basic class.

Empty digit : A digit which retains its ordinal value without having any semantic value.

Indicator Digit : A connecting symbol preceding a facet.

Interpolation : Insertion of a term or number between two existing terms or numbers. A technique to accommodate a new idea.

Isolate : An idea that can be fitted in any basic subject.

Octave Principle : (Octave means eight) Principle which uses the numbers only upto eight. The number nine is not used for the division of a subject. Instead it is used as the octavising digit to start another array of numbers like 91,92,93..... 98,991,992,993 ..... 998; 9992,9993.....9998. This method provides for an infinity of coordinate numbers in an array.

Ordinal Value : A value that denotes the position of a number in a sequence of numbers like first, second, third etc.

Postulate : Something taken as self-evident or assumed as the basis for argument; taken for granted.

Semantic Value : The relationship between signs, symbols and what they represent.

Speciator : A term used to denote an organ, a property, material , a geographical division or a time division to individualise an isolate.

15.19 MODEL EXAMINATION QUESTIONS

I ESSAY QUESTIONS

1) Explain briefly the dynamic theory of classification underlying the Colon Classification.

2) Write an essay on the structure and features of Colon Classification, 6th edition.

II. SHORT NOTES

a) CC7

b) S.R. Ranganathan

UNIT - 16 : TRENDS AND DEVELOPMENTS IN LIBRARY CLASSIFICATION

Contents

16.0 AIMS AND OBJECTIVES

This Unit is mainly intended to present the trends and developments of library classification. After studying this unit, you will be familiar with

- the major developments of library classification upto 1950s
- the contributions of CRG, BSO and On-line classification systems
- classification research carried out in India.

16.1 INTRODUCTION

The library classification has become increasingly important for systematic arragement of documents on the shelves in the most helpful sequence and easy retrieval as and when required. Its usefulness has increased further on account of greater emphasis being laid down on the provision of information service in library and information centres. However, we require powerful tools and techniques for systematic organisation of subject information and its retrieval. With the recognition of the importance of classification in the computerised information retrieval, its role has further been extended.

16.2 MAJOR DEVELOPMENTS OF LIBRARY CLASSIFICATION UPTO 1950s

The period from the second half of the 20th century onwards is considered the 'golden period' due to the establishment of FID Committee on Classification Research (FID/CA) in 1950. Before discussing about the trends and developments of library classification from 1950 onwards, we should have a bird's eye view of the some of the earlier attempts. However, the earlier attempts relating to classification were concentrated mainly on designing of the general classification schemes. Some of the notables among them are Melvil Dewey's *Decimal Classification* (1876); Paul Otlet and Henry De La Fontaine's *Universal Decimal Classification* (1905) and *Bliss Bibliographic Classification* (1953). Keeping in view the limitations of the DC and UDC, Ranganathan developed Colon Classification in 1933. In order to help in designing of such classification schemes, some E.C. Richardson (1901), H.E.Bliss (1933) and W.C.B. Sayers (1926) have developed some general theories. Such general theories provide a base to Ranganathan to formulate guiding principles in his *Prolegomena to Library Classification* (1937) that ultimately led to the development of a dynamic theory of classification.

Since the early fifties, the period was mainly dominated by Ranganathan, and the trends followed by Ranganathan are:

* Separation of work of classification into three planes and formulation of guiding principles in each plane
* Grouping of isolates into five fundamental categories.
* Formation and accommodation of new subjects
* Versatility of the notational system

16.3 MAJOR DEVELOPMENTS OF LIBRARY CLASSIFICATION AFTER 1950s

The successive editions of various major schemes of general classification continued to come in. The other major trends of classification after 1950s are:

* Formation of Classification Research Group
* Broad System of Ordering
* Computer Generated Classification Scheme
* Classification in On-line systems

16.3.1 Classification Research Group (CRG)

The first major development of early 1950s was the formation of Classification Research Group. The Royal Soceity's Scientific Information conference was held in 1948 in London when Ranganathan's faceted classification began to make an impression in the western world. All the participants of the conference were dissatisfied with the then prevailing method of subject organisation and a committee was set up to examine the existing systems and to suggest possible improvements. But no significant progress was made until 1951 and B.C.Vickery was invited to form a group to take over the work of the committee. This lead to the development of CRG in 1952.

The members of the CRG were dissatisfied with the prevailing classification schemes and felt Ranganathan's faceted approach to classification had more to offer than the theories developed by others. Based on these preliminary discussions CRG published a manifesto on "The need for a faceted classification as the basis of all methods of information retrieval" in

1955. This manifesto emphasises three basic issues namely Facet analysis as the basis of library classification, Farrandane's theory of relationship and the use of simple notation. The members concentrated mainly on the construction and the use of special schemes of classification. They formulated many special schemes, which were faceted ones, based mainly on the principles propounded by S.R.Ranganathan. Another important area, which drew the attention of members, was the analysis of relationships between different concepts. In this context, the work of J.E.L.Farrandane's 'Relational operators' is extremely significant.

During the 1960s it concentrated on the study of the relation between the special and general classifications, and the problems relating to the construction of a new general classification. At this time two important developments took place:

(i) The first International Study Conference on Classification held at Dorking in 1957 discussed and upheld CRG's memorandum on 'the need for a faceted classification as the basis of all methods of information retrieval'.

(ii) In 1962 NATO awarded a grant to CRG, to convene a conference to study the feasibility of a new general classification scheme. Following the conference, one fulltime research assistant was appointed to work under this project to serve the two different purposes of Shelf arrangement and Computerised information retrieval.

Later it was found that the project could not serve both the important purposes due to the problem of notation and problem of organisation of concepts. Further, in the designing of a general classification scheme two other problems viz. Organisation of concepts into facets and Arrangement of facets in helpful order have to be solved.

However, as envisaged by CRG, the compilation of a new general classification scheme became doubtful for the following reasons :

* The need to develop a scheme for Computerised information retrieval disappeared because of the latest generations of computers.
* CRG's view to abandon special schemes is difficult, as disciplines still form a normal approach of a common reader.

The CRG belileved that no general scheme suitable for computer retrieval was available and it was decided to develop a general classification in association with the UK-MARC project, (which made use of PRECIS indexing method) for an automated retrieval system. CRG was also interested in thesaurofact, which is comprised of a thesaurus and a faceted classification used for shelf arrangment, subject cataloguing as well as for post coordinate indexing.

The thesaurofacet is the another significant contribution of the CRG. This is a classification scheme for engineering and allied topics, combined with a thesaurus for post co-ordinate indexing. This can serve as alphabetical index to the classification scheme.

CRG and Integrative Levels

Instead of breaking down the universe of knowledge into classes and analyzing the classes to individual concepts, CRG thought that it could be more helpful if the concepts themselves are organised. The concepts built up to make subjects and the universe of knowledge would appear as the final product. In other words, rather than taking a top-down approach to classification, i.e., predetermining areas of knowledge and then breaking them down, the CRG advocated a bottom-up approach. The bottom-up approach means the forming of areas of knowledge after having pieced together concepts. The CRG looked towards the theory of integrative levels to provide a basis for the bottom-up approach.

This theory stressed the importance of the developmental progression of entities based upon the structure of their internal components. Therefore, this theory advocates an evolutionary development of entities, though it is not new to classification. The only difference between the order proposed by integrated levels and that one suggested in the 19th century is that the former

is built upon an upwardly-directed evolution, whereas the latter is built upon a downwardly-directed evolution of entities.

The application of the theory of integrative levels to classification raises a series of interesting problems. It is, therefore, necessary to examine each entity in isolation and to establish its characteristic features before analysing its relations with other phenomena. The problem of subjectivity in a classification system cannot be totally avoided by using the theory of intergrative levels. Foskett also suggests that too much integration could lead to 'disintegration'.

The CRG later discovered a major flaw with the theory of integrative levels and formed a branching structure rather than a single sequence. Integrative levels do not only involve a linear progression upward, branching also occurs as a means of further dividing and sub-dividing. Certain levels may build up to two or more fields, which may either sub-divide further, or come to an end of level building. The implication is that this theory cannot be used as a basis for a single sequence of classes.

Richmond opined that the theory of integrative levels is similar to the derivation of class entities from the collection of foci in a faceted classification system. Both the systems involve a form of inductive reasoning, wherein classes are inferred from aggregates to particulars. This reasoning from parts to a whole involves an inductive 'leap.' The real benefit of integrative levels is that the process of classification requires an exact analysis and description of every step in the process, which means that the inductive leap will have to be defined in terms of its composition, factor by factor. The theory, therefore, gives validation and method to the inductive, bottom-up approach to classification.

The CRG never resolved specifically how the theory of integrative levels is useful in a classification system. The significance of the theory is, it provided the CRG with further reinforcement of its belief that areas of knowledge can be determined only after an analysis of their composition, rather than by pre-determining areas of knowledge and then deciding how to break them down into their component parts.

Self-Check Exercise-1

What is the contribution of CRG to the field of classification?

Note i) Give your answer in the space provided below.

ii) Compare your answer with the model answer given at the end of this unit.

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16.3.2 Broad System of Ordering (BSO)

The major trend of library classification in 1970s was development of Broad System of Ordering (BSO). FID initiated the work on BSO to handle scientific and technical information needed for UNISIST. It was intended mainly to prepare a broad classification to serve as a switching language between different information systems. Thus a broad classification was aimed to serve as a switching mechanism to link different classification, indexing languages and thesauri in the process of information transfer between information centres in a network. Later, FID appointed a small panel consisting of three presons to prepare and complete a single BSO for UNISIST. BSO - *Broad System of Ordering: Schedule and Index* was published by

FID in 1978 `as a classification system for the whole field of knowledge`. The BSO Manual published in 1979 under the name of *The development, rationale and use of the Broad System of Ordering* gives an extended treatment of the scheme.

One of the major needs of this worldwide system is using' Switching Language' as a method of identifying the coverage of publications in a universally recognizable way. Such method enables the libraries to select and acquire material from foreign countries without necessarily being fluent in the language. Hence, it was described as a general classification scheme for information exchange and switching.

The schedules of BSO are shown at three levels. The first is a list of main headings called subject area; the second lists the main subject fields while the third gives complete details of all the subject field divisions. As far as the notation is concerned, BSO uses Indo Arabic Numerals as the base and supplemented by two punctutation marks i.e. hyphen and comma; and other symbols are only sparingly used. The notation used in BSO is brief, non-hierarchical and hospitable.

BSO is a faceted system, though it was not deemed advantageous to set out the facet structure explicity in the schedules. In addition to this, some of the common facets are also provided in the BSO schedules. The provision for organised information sources dealing with wide multidisciplinary spectra of subjects and a detailed index with cross refrences are the other important features of the BSO.

Self-Check Exercise-2

What are the major features of the BSO ?

Note: i) Give your answer in the space provided below.

ii) Compare your answer with the model answer given at the end of this unit.

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16.3.3 Automatic Keyword Classification

Another important trend following the above two developments is the use of computer for production of the classification scheme. This kind of projects are already familiar in USA and UK in which computers are used to form group of terms or of related concepts (Clumps) which are shown to occur regularly together and which would function in the same way as a classification scheme does. During the project, various methods of forming classes were used, but those given by strings, stars, cliques and clumps were found to be the most successful. Out of a number of search methods used, the one dealing with simple class matching proved the best. All these results seem to indicate that computer-generated classification schemes can give better results than the use of single term alone, and that this line of research is worth persuing.

16.3.4 Classification in On-line Systems

Classification has always played an important role in retrieving of information through manual systems and assumed to have at least equal importance in the on-line information retreival. However, the effectiveness of classification in the on-line systems is yet to be fully exploited. In view of this, in 1984 IFLA Standing Committee on Classification and Subject Cataloguing accepted the challenge to identifying and encouraging the research and development

needed in the field of on-line systems. Further, it was intended primarily to investigate in classification and its role in the areas of on-line catalogues, bibliographic databases and full-text retreival systems.

The traditional classification systems are used advantageously in on-line searching in three ways. They are direct classification search method (user enters the class mark and the system displays relevant records), using classification as a linking device (a suitable subject heading and its related class number used to locate bibliographic records from classified catalogue) and using index to the classification schedules (indexes to the schedules are fairly good subject indexes) in the On-line OPAC.

(i) DDC On-line Project by CLR

In 1984 when the DDC 19th edition was available in machine-readable form, Council on Library Resources (CLR) decided to undertake the reasearch in this direction. In 1985 DDC on-line project was conducted by Forest Press and OCLC under the sponsorship of CLR to study the feasibility of how far 'the index and schedules of a library classification can be incorporated into an on-line catalogue to enhance subject access to its contents'. However, the results of this project reported that the DDC enhances subject access to bibliographic record, subject searching strategies in on-line catalogues and the display of bibliographic information.

(ii) LC's On-line Project

With the encouragement received from the success of DDC On-line project in 1987, Library of Congress On-line project was formally announced in 1988. The report indicated that LC will be in a position to finalise the MARC format, if MARC format developed for LC is satisfactory, the same can be done for other classification systems like DDC,UDC and BC. Later, a working format has been developed as an extension of the LC project and realised that in each case a much more in-depth study is required and the time is right to consider the possibility of an international MARC format which would accommodate the world's major schemes.

(iii) OCLC's On-line Project

Another project at OCLC aims at on-line classifying with additional facilities for keyword searching, hierarchical browsing and multiple display options. Later, one more project intended to work on experimental classification interface called'Dewey on-line retrieval system'. Further, the classification provides possibility of developing user friendly interface systems, which concerned with the interchange of information between searcher and the system. A well designed user friendly interface not only covers idiosyncrasies of the search and retrieval mechanisms but also increases the browsability through subject headings, class numbers and keywords. Among these three approaches, the class numbers approach helps users to bring together all the books on the same subject in OPAC's irrespective of its location.

Self-Check Exercise-3

What are the major on-line systems in classification ?

Note: i) Give your answer in the space provided below.

ii) Compare your answer with the model answer given at the end of this unit.

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16.4 INTERNATIONAL CONFERENCES ON CLASSIFICATION RESEARCH

16.4.1 FID/CR Conferences

FID/CR (FID Committee on Classification Research) is the body, which concerned much with classification research. As a part of its objective, it has been conducting the conferences continuously on classification research since 1957. It has conducted six conferences so far, focussed on various topics like Classification for Information Retrieval (First Conference in Dorking, 1957); Classification Research (Second Conference in Elsinore, 1964); Ordering Systems for Global Information Networks (Third Conference in Bombay, 1975); Universal Classification: Subject analysis and Ordering systems (Fourth conference in Augusburg, Germany, 1982); Classification Research for Knowledge Representation and Organization (Fifth conference in Toronto, Canada, 1991); and Knowledge Organization for Information retrieval (Sixth conference in London, 1997).

16.4.2 ISKO Conferences

Another body that much concerns with library classification is International Society for Knowledge Organisation (ISKO) founded in 1989. It is the leading international society for organization of knowledge. Its main mission is to advance conceptual work in knowledge organization in all kinds of forms and for all kinds of purposes such as databases, libraries, dictionaries and the Internet. As an interdisciplinary society it brings together professionals from different fields throughout the world, such as information science, philosophy, linguistics, computer science, as well as special domains such as medical informatics.

In order to achieve its mission and goals, it works towards promotion of research, development and applications of knowledge organization systems, providing the means of communication and networking on knowledge organization for its members. It acts as a connecting link between all institutions and national societies, working with problems related to the conceptual organization and processing of knowledge.

ISKO has been conducting the national conferences for every two years on different topics like Challenges of Knowledge Organisation in 21st century, Dynamism and Stability in Knowledge Organisation, Structures and Relations in Knowledge Organisation, Knowledge Organisation and Change, Knowledge Organisation and Quality Management and Congitive Paradigms in Knowledge Organisation. So far it had conducted seven conferences and seventh conference was conducted recently in July 2002 on Tools in Knowledge Organisation & Human Interface. Eighth conference is proposed in 2004 in London.

16.5 GENERAL CLASSIFICATION SCHEMES

The latest 21st edition of DDC was published in two conveneient formats i.e print format and as well as windows version by incorporating number of changes. This newest revision of DDC 21st is the Electronic Dewey published in 1996. The 22nd edition of DDC is expected to come out in 2003. Regarding UDC the British Standards Institution (BSI) launched its Web version of the classification in June 2001 and continues to improve it to maximum extent. It also issued the 1993 English Medium edition in print form on demand. BSI/DISC issued a separate publication of the Area Table for the United States of America and Canada, containing recent revisions at the end of 2001. The publication of a multilingual version on CD-ROM, initially in English, French and Spanish, is under preparation.

16.6 CLASSIFICATION RESEARCH IN INDIA

The classification research that was carried out in India was mainly the contribution of Dr. S.R.Ranganathan, the father of Library Science. His contributions mainly dominated during the period of 1950s.

Ranganathan's contributions are restricted mainly to three areas i.e. Subject classification, Knowledge organisation and Subject indexing. The two principal postulates of Ranganathan's General theory of knowledge classification are Postulate of Basic subjects and the Postulate of Fundamental categories. Further, the postulates and principles at General theory of Knowledge classification are also applied to database design and development. He formulated a dynamic and comprehensive theory to guide research, development and practical applications in knowledge organisation, classification and indexing to cope with the changes in the universe of knowledge. This holistic approach further led him to the formulation and adoption of set of Normative principles applicable at different levels of intellectual work. He divided the whole work of classification into three mutually influencing planes of work namely Idea plane, Verbal plane and Notational plane. To secure consistency in the notational plane he recommended making use of Scheduled, Systematic and Seminal mnemonics.

Ranganathan's other contributions include: Formulation of a practical methodology for the design and development of schemes of classification of micro subjects embodied in periodical articles, technical reports and other micro documents; development of principles of facet sequence for the structuring and organisation of knowledge embodied in documents; development of postulation of an 'Absolute Syntax' for organisation of component ideas of a subject, etc. His work has helped in a better understanding of the principles underlying classificatory languages and in laying the foundations for a science of Documentation.

Even the CRG members of the UK have also been in contact with Ranganathan and deliberated on various aspects of classification including Ranganathan's work. He founded Sarada Ranganathan Endowment in Library Science (SRELS) in 1961 with an intention to support research and dissemination of findings through publications. Classification and Subject indexing is included in the series of its lectures,

Rangananthan further initiated and established Documentation Research and Training Centre (DRTC) in 1962, to take active part in research on classification and related areas. It concentrated mainly in the areas of: Study of structure and development in the universe of subjects; development of a theory of library classification & design; revision and continuous updating of schemes for library classification; and application of computers . The DRTC annual seminar volumes often carried the first papers of the findings of such research.

The research mainly done at DRTC was reviewed and published as FID/CR reports, ISKO and FID conferences, etc. Till the death of Dr. S.R.Ranganathan, DRTC actively engaged in classification research. After this, much progress was not made expect bringing out the seventh edition of Colon Classification. During 1970s and 80s Dr.Battacharya proposed a general theory of subject indexing languages based on a detailed anlysis of the subject indexing languages of Dewey, Cutter, Kaiser and Ranganathan. His contribution to POPSI has been well appreciated by the library classificationsits throughout the world.

In this age of electronic communication and global networks there is a growing interest in applying classificatory techniques including faceted approach in the better organisation, more precise retrieval and helpful presentation of the retrieved information. This could reduce the user effort, retrieval noise and thereby enhance the overall efficiency of services.

Self-Check Exercise-4

What are Ranganathan's contributions to classification theory?

Note i) Give your answer in the space provided below.

ii) Compare your answer with the model answer given at the end of this unit.

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16.7 SUMMING UP

The present unit discusses the trends and developments of library classification theory. Among them some of the important trends and developments are:

* CRG worked towards general classification system for an automated retrieval.
* CRG wants to organise the concepts themselves and for this it advocated the bottom up approach
* CRG looked towards the theory of integrative levels as a basis for the bottom-up approach
* With the initiation of FID, BSO was developed as a general classification scheme for information exchange and switching.
* With an intention to identify and encourage the research and development needed in the field of on-line classification systems, three important on-line projects like CLR's DDC On-line Project, LC's On-line Project and OCLS's On-line Project were carried out.
* Review of the conferences conducted by FID Committee on Classification Research and ISKO
* Latest developments of library general classification schemes like DDC and UDC
* Classification research carried out in India.

16.8 MODEL ANSWERS

1) CRG published a manifesto on "The need for a faceted classification as the basis of all methods of information retrieval" in 1955. During the 1960s it concentrated on study of the relation between the special and general classifications, and the problems relating to it. CRG decided to develop a general classification in association with the UK-MARC project for an automated retrieval system, since no general scheme is suitable for computer retrieval. Thesaurofacet is the another contribution of the CRG. Further, CRG took the basis of theory of integrative levels to organise the concepts themselves using bottom-up approach,

2) FID initiated the development of Broad System of Ordereing (BSO) to handle scientific and technical information needed for UNISIST. It was intended mainly to prepare a broad classification to serve as a switching language between different information systems. It published the *BSO-Broad System of Ordering: Schedule and Index* in 1978 as a classification system for the whole field of knowledge. One of the major needs of this worldwide system was using "'Switching Language" which enables the libraries to select and acquire material from foreign countries without being fluent in the language.

Hence, it was described as a general classification scheme for information exchange and switching. The schedules of BSO is brief,non-hierarchical and hospitable.

3) Classification has always played an important role in retrieving of information through manual systems and assumed to have at least equal importance in the on-line systems is yet to be fully exploited. In view of this, in 1984 IFLA Standing Committee on Classification and Subject Cataloguing accepted the challenge identifying and encouraging the research and development needed in the field of on-line systems. With its active encouragement three important on-line classifcation projects were carried out. They are CLR's DDC on-line project, LC's on-line jproject and OCLC's on-line project.

4) The classification research that was carried out in India was mainly the contribution of Dr.S.R.Ranganathan, the father of Library Science. Ranganathan's contribution are restricted mainly to three areas i.e. Subject classification , Knowledge organisation and Subject indexing. He formulated a dynamic and comprehensive theory to guide research, development and practical applications in knowledge organisation, classification and indexing to cope with the changes in the universe of knowledge. His other contributions are formulation of methodology for designing of depth schedules and development of postulation of an 'Absolute Syntax' for organisation of component ideas of a subject etc. He founded SRELS and initiated to establish DRTC to support research in library classification and related areas and disseminate findings through its publications.

16.9 ASSIGNMENTS

1) Critically examine the work of Classification Research Group (CRG) on the theory of integrative levels. How it is different from the fundamental categories in organising the concepts of universe of knowledge?

2) Survey the literature on library classification and list out the contributions of Dr. Ranganathan.

16.10 RECOMMMENDED BOOKS

Krishan Kumar. *Theory of Classification.* 3rd ed. New Delhi: Vikas, 1983.

Information systems, *networks* and *services in India: Developments and Trends.* Vol.2. Ed by A. Neelameghan and K.N.Prasad. Chennai & Bangalore: Ranganathan centre for Information Studies, 1998.

16.11 GLOSSARY

BSO : Broad System of Ordering is a classification system developed by FID to meet the scientific and technical information needs of the UNISIST.

CRG : CRG is the Classification Research Group established in London in 1952 to carry out the research in the field of classification.

UNISIST : It is a scientific and technical information system developed to meet the information needs of the scientists and technicians.

16.12 MODEL EXAMINATION QUESTIONS

I. ESSAY QUESTIONS

1) Trace the major developments in library classification in the last four decades.

2) What is BSO ? Explain its purpose and salient feature

II. SHORT QUESTIONS

1) On-line Classification projects

2) ISKO Conferences.

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