Chapter 1
Sets

Concept: Representation of a set

Concepts:- Different types of sets – Subsets- Power sets – Universal set –
Operations on sets – Compliment of a set – Practical Problems.

Text book questions

Ex: 1   Questions 3, 4,5
Ex: 2   Questions 1, 2
Ex: 3   Questions 4, 5,6*,7*
Ex: 4   Questions 4, 6, 9
Ex: 5   Questions   4*, 5*
Misc.Ex: Questions 8, 9, 11, 15**, 16**
Example   Question: 34**

Note: *   *Important*

               **   *Very Important*

Extra/HOT questions

1. Write the following sets in set builder form
    I)   {1/4, 2/5, 3/6, 4/7, 5/8}
    II)   { ...., -5, 0, 5, 10, ...}
    III)   {-4, 4}
2. Let A, B and C are three sets then prove the following:
    i) $A - (A \cap B) = A - B$
    ii) $(A - B) \cup (B - A) = (A \cup B) - (A \cap B)$
    iii) $A - (B \cap C) = (A - B) \cup (A - C)$
    iv) $A \cap (B - C) = (A \cap B) - (A \cap C)$
3. Draw Venn diagrams for the following sets:
    i) $(A - B)' \cap A$
    ii) $(A \cap B \cap C)'$
    iii) $(A \cap B)'$ if $A \subset B$
    iv) $(A - B) \cap (A \cup B)$
    v) $(A \cap B)'$ if A and B are disjoint sets

vi) $(A \cup B \cup C)'$

vii) $(A - B) \cup (A \cap B)$

4. In a survey of 100 students, the number of students studying the various languages were found to be English only 18, English but not Hindi 23, English and Sanskrit 8, English 26, Sanskrit 48, Sanskrit and Hindi 8, Number of no language 24. Find

   i)   How many students were studying Hindi?

   ii)   How many students were studying English and Hindi

          [Ans:18,3]

5. In a survey of 25 students it was found that 15 had taken Maths, 12 had taken Physics and 11 had taken Chemistry, 5 had taken Maths and chemistry, 9 had taken Maths and Physics, 4 had taken Physics and Chemistry and 3 had taken all the three subjects. Find the number of students that had taken:

   i)   Only Chemistry

   ii)   Only Maths

   iii)   Only Physics

   iv)   Physics and Chemistry but not Maths

   v)   Maths and Physics but not Chemistry

   vi)   Only one of the subject

   vii)   At least one of the subjects

   viii) None of the subjects   [Ans:5, 4, 2, 1, 6, 11, 23, 2]

6. Of the members of three athletic team in a certain school, 21 are in the Basketball Team, 26 in the Hockey team and 29 in the Football team. 14 play hockey and basketball, 15 play hockey and football, 12 play football and basketball and 8 play all the three. How many members are there in all?

                        [Ans:43]

7. In a survey of 100 persons it was found that 28 read magazine A, 30 read magazine B, 42 read magazine C, 8 read magazines A & B, 10 read magazine B&C and 3 read all the three. Find:

   i)   How many read none of the magazines?

   ii)   How many read magazine C only?

   iii)   How many read magazine A only?

   iv)   How many read magazine B & C but not A ?

        [Ans:18,32,13,0]

8. Let A and B be two finites sets such that n(A) = m and n(B) = n. If the ratio of number of elements of power sets of A and B is 64 and

n(A) + n(B) = 32. Find the value of m and n.

[Ans:19, 23]

9. In a survey of 400 students of a school, 100 were listed as smokers and 150 as chewers of Gum, 75 were listed as both smokers and gum chewers. Find out how many students are neither smokers nor gum chewers. [Ans:225]

10. In a university out of 100 teachers, 15 like reading newspapers only, 12 like learning computers only and 8 like watching movies only on TV in the spare time. 40 like reading news papers and watching movies, 20 like learning computer and watching movies, 10 like reading news paper and learning computer, 65 like watching movies. Draw a Venn diagram and show the various portions and hence evaluate the numbers of teachers who:

i)   Like reading newspapers

ii)   Like learning computers

iii)   Did not like to do any of the things mentioned above. [62, 39, 1]