

# SAMASEERKALVI – 9<sup>th</sup> STD

## THEORY OF SETS

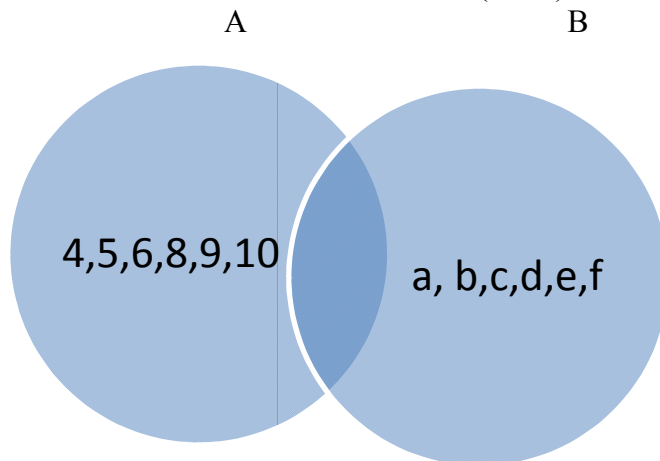
### SECTION III

Time: 1 hour. 40 minutes]

[15 x 5 = 75

Answer all questions:

1. Represent the union and intersection of two sets P and Q in Venn diagram, if  $A \subseteq B$ .
2. Write elements of  $A \cap B$  and find  $n(A \cup B)$



3. Identify the following sets are finite or infinite. Give reasons for your answer.
  - i)  $X = \{x : x \text{ is even prime number}\}$
  - ii)  $Y = \{x : x \text{ is a number divisible by } 5\}$
  - iii)  $P = \{x : x \in \mathbb{W}\}$
  - iv)  $Q = \text{The set of letters from the word "beautiful"}$
4.
  - i) If  $n[P(A)] = 2048$ , find  $n(A)$ .
  - ii) If  $n[P(A)] = 1$ , Write your result about A.
5. If  $\cup = \{5, 10, 15, 20, 25, 30, 35, p, q, r, s, 1, 2\}$  and  $A = \{10, 20, 30, p, q, r, 2\}$ . Prove that  $A \cup A' = \cup$ .
6. If  $X = \{x : x \text{ is an odd prime } 5 < x < 29\}$  and  $Y = \{x : x \in \mathbb{N}, 1 < x < 30\}$ , find  $X \cap Y$  and  $n(X \cap Y)$ .
7. Find  $A - B$  and  $B \setminus A$  for the following sets.
  - i)  $A = \{1, 2, 3, 4, 5, 6, 7, 10, 12, 13, 15\}$  and  $B = \{8, 9, 10, 11, 12, 13, 14, 15, 16, 21, 23\}$
  - ii)  $A = \{a, e, i, o, u\}$  and  $B = \{m, n, o, p, q, r, x, y, z\}$
8. If  $A = \{s, t, x, y, z\}$  and  $B = \{p, q, r, s, t, u, v, x, y\}$ , then using Venn diagram, Prove  $n(A) + n(B) - n(A \cap B) = n(A \cup B)$ .
9. If  $\cup = \{x : x \in \mathbb{Z}, -3 \leq x < 5\}$ ,  $X = \{-1, -2, -3, 4\}$  and  $Y = \{-1, -3, 1, 2, 3, , 5\}$ , find  $\cup - A = A'$  and  $\cup - A' = A$ .
10. A company recruits candidates with Management degree for their job requirements. Company's requirements are
  - i) Candidate must have 3 years experience.
  - ii) Candidate must identify and solve the problems.

25 candidates appeared for the interview. Among them 23 have eligible degree, 10 have ability have skills to solve problems and 5 have both. Using Venn

diagram, find the number of candidates who were selected by the company to satisfy their requirements.

11. Draw Venn diagrams for the following:

i)  $A \cup B$

iv)  $A \cap B'$

ii)  $A \cup B'$

v)  $(A \cap B)'$

iii)  $A' \cap B$

12. In a survey of 450 people, it was found that 350 people see Tamil channels and 225 people see only Tamil channels. If 275 people see Hindi channels, find the number of people who did not see either of the channels if 200 people watch both the channels. (Survey is made for these two channels only).
13. 500 students wrote the entrance examination of a school. It is found that 233 students more than 50% in Mathematics and 304 students 60% in English. Find the number of students who scored more than 50% in both the subjects. (Use Venn diagram)
14. In an examination 200 students scored distinction in Mathematics and Science. 150 students scored distinction in Mathematics alone. Find how many students scored distinction in Science alone if 500 students wrote the examination.
15. In a sports club a competition were conducted for indoor games chess and carom. 70 members played chess, 55 members play carom and 22 play both the games. Using Venn diagram find the following:
- The number of members who played only chess.
  - The number of members who played only carom and
  - The number of players who played all the two games.