Chapter- 4

WORK SHEET

1. If n (A – B) = 12, n (B – A) = 16 and n(A ∩ B) = 5, find:
   (i) n(A)
   (ii) n(B)
   (iii) n(A ∪ B)
2. If n(ξ) = 40, n(A') = 15, n(B) = 12 and n((A ∩ B)') = 32, find :
   (i) n(A)
   (ii) n(B')
   (iii) n(A ∩ B)
   (iv) n(A ∪ B)
   (v) n(A – B)
   (vi) n(B – A)
3. If n (ξ) = 40, n(A) = 20, n(B') = 16 and n(A ∪ B) = 32, then find n(B) and n(A ∩ B).
4. If n ξ = 20 and n(A') = 7, then find n(A).
5. If 4 = {x : x ϵ W, x ≤ 10}, A. = {x : x ≥ 5} and B = {x : 3 ≤ x < 8}, then verify that:
   (i) (A ∪ B)' = A' ∩ B'
   (ii) (A ∩ B)'= A' ∪ B'
   (iii) A – B = A ∩ B'
   (iv) B – A = B ∩ A'
6. If ξ = {natural numbers between 10 and 40}
   A = {multiples of 5} and
   B = {multiples of 6}, then
   (i) find A ∪ B and A ∩ B
   (ii) verify that
   n(A ∪ B) = B (A) + n(B) – n(A ∩ B)
7. Find the proper subsets of $\{x : x^2 – 9x – 10 = 0\}$
8. Find all the subsets of each of the following sets :
   (i) A = {5, 7}
   (ii) B = {a, b, c}
   (iii) C = {x : x ∈ W, x ≤ 2}
   (iv) {p : p is a letter in the word 'poor'}
9. Given the universal set = {-7,-3, -1, 0, 5, 6, 8, 9}, find :
   (i) A = {x : x < 2}
   (ii) B = {x : -4 < x < 6}
10. If T = {x: x is a letter in the word 'TEETH'}, find all its subsets.
11. Given, A = {Triangles}, B = {Isosceles triangles}, C = {Equilateral triangles}. State whether the following are true or false. Give reasons.
    (i) A ⊆ B

(ii) $B \subseteq A$

(iii) $C \subseteq B$

(iv) $B \subset A$

(v) $C \subset A$

(vi) $C \subseteq B \subseteq A$

12. State, whether the following pairs of sets are equivalent or not:

(i) $A = \{x: x \in N \text{ and } 11 \geq 2x - 1\}$ and $B = \{y : y \in W \text{ and } 3 \leq y \leq 9\}$

(ii) Set of integers and set of natural numbers.

(iii) Set of whole numbers and set of multiples of 3.

(iv) $P = \{5, 6, 7, 8\}$ and $M = \{x : x \in W \text{ and } x < 4\}$

13. Find the cardinal number of the following sets :

(i) $A_1 = \{-2, -1, 1, 3, 5\}$

(ii) $A_2 = \{x : x \in N \text{ and } 3 \leq x < 7\}$

(iii) $A_3 = \{p : p \in W \text{ and } 2p - 3 < 8\}$

(iv) $A_4 = \{b : b \in Z \text{ and } -7 < 3b - 1 \leq 2\}$

14. (i) Is $\{1, 2, 4, 16, 64\} = \{x: x \text{ is a factor of } 32\}$? Give reason.

(ii) Is $\{x: x \text{ is a factor of } 27\} \neq \{3, 9, 27, 54\}$? Give reason.

(iii) Write the set of even factors of 124.

(iv) Write the set of odd factors of 72.

(v) Write the set of prime factors of 3234.

(vi) Is $\{x: x^2 - 7x + 12 = 0\} = \{3, 4\}$?

(vii) Is $\{x : x^2 - 5x - 6 = 0\} = \{2, 3\}$

15. (i) $A_1 = \{x : 2x + 3 = 11\}$

(ii) $A_2 = \{x : x^2 - 4x - 5 = 0\}$

(iii) $A_3 = \{x : x \in Z, -3 \leq x < 4\}$

(iv) $A_4 = \{x : x \text{ is a two digit number and sum of digits of } x \text{ is } 7\}$

(v) $A_5 = \{x : x = 4n, n \in W \text{ and } n < 4\}$

(vi) $A_6 = \{x : x = n/n+2; n \in N \text{ and } n > 5\}$