MATHEMATICS

Time allowed: 1 hour **Max Marks: 35**

1. Write all the subsets of the following sets: (2)

   (i) {a,b} (ii) φ

2. (i) Write the power set of A, where A = {–1, 0, 2} (1)

   (ii) Let A = φ, find P(P(A)). Also write n(P(P(A))) (2)

3. Taking the set of natural numbers as the universal set, write the complements of the following sets: (4)

   (i) A={ x:2x+5=9}

   (ii) B={ $x = x$ is a prime number}

   (iii) C={ x: 3x -1<14}

   (iv) D={ x: x is a perfect cube}

4. Write the following in Roster Form: (2)

   (i) A={ x: $x \in$I and x^2<27}

   (ii) The set of all integers x for which $\frac{45}{x}$ is a natural number.

5. Write the following in Set Builder Form: (2)

   (i) A=$\left\{\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \ldots\ldots \frac{8}{9}\right\}$

   (ii) B={2, 4, 8, 16, 32, 64}

6. Let A = { x: x is a positive prime less than 10}, (2)

   B={ x: $x \in$ N and o< x-2}.

   Find (i) A∩B (ii)B–A

7. If U={1,2,3,4,5,6,7,8}, A= {1,2,3,5,6} and B [2,3,4,7,8] (2)

   Find (i) $A \cap B^1$ (ii) $(A \cup B)^1$ (iii) A-B (iv) A∪B

8. Draw a suitable Venn diagram for: (2)

   (i) $(A \cap B)^1$ (ii) $A^1 \cup B^1$

9. Write the following set in Set Builder Form: (2)

   (i) A={2,4,8,16} (ii) B = {41,43,47}

10. Two finite sets have m and k elements. If the number of subsets of the first set is 112 more than the number of subsets of the second set, find the values of m and k. (2)

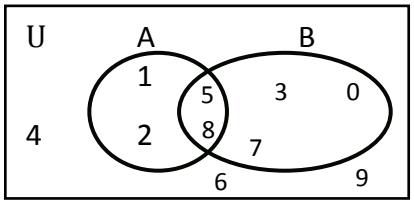
11. If A={1,2,3,4} B={3,4,5,6} and C={1,3,5}, then verify that: $A-(B\cup C)=(A-B)\cap(A-C)$ (2)

12. From the adjoining Venn diagram, determine the following sets: (2)

(i)B–A (ii) $(A\cap B)^1$

13. If A and B are two sets such that $A\subset B$? then what is: (2)

(i)$A\cup B$ (ii)$A\cap B$



14. Let A, B, and C be three sets. If $A\in B$ and $B\subset C$, is it true that $A\subset C$? If not, give an example. (2)

15. Write the following in Set Builder Form: (2)

(i) [6, 12] (ii) [-23,5)

(ii) Let A={1, 2, {3, 4}, 5}. Which of the following statements are incorrect 8 why? (2)

(a)$\{3,4\}\subset A$ (b)$1\subset A$ (c)$\{1,2,3\}\subset A$ (d)$\{\{3,4\}\}\subset A$