MATHEMATICS

Time Allowed : 1 hrs **M.M. 35**

1. (i) If the ordered pairs (a,-1) and (5, b) belongs to { (x, y): y=2x-3}, Find the values of a and b. **1**

(ii) Write the relation R = {(x, x^3) : x is a prime number less than 10 } Rostor Form **1**

2. Let R be a relation : R = {(1,-1), (2,0), (3,1), (4,2), (5,3)}, then **2**

(i) Write the domain and the range of R.

(ii) Write R in builder form.

3. (i) If n(U)=48 and n ($A^1 \cup B^1$)=36, then find (A∩B). **1**

(ii) If n (U) =50, n(A)=30 and n(B) = 28, Find **2**

(a) the greatest value of n (A∪B)

(b) the least value of n (A∩B)

4. In a group of 65 students, 40 like cricket, 10 like both cricket and tennis. How many like tennis only and not cricket? How many like tennis? **2**

5.(i) If (-1,1), (2,3), (1,0), (2,1) are some of the elements of A×B, then find A and B. Also, find the remaining elements of A×B. 2

(ii) Find the Linear relation between the components of the ordered pairs of the relation where **2**

R={(0,2), (-1,5), (2,-4), ……}

6. Out of 20 students in a class, 12 like tea and 15 like coffee. Assume that each one likes at least one of the two drinks, how many like **3**

(i) Both tea and coffee?

(ii) Only tea and not coffee?

(iii) Only coffee and not tea?

7. Let A = {1,2,3,4,5,6}. Define a relation R from A to A by R = {(x,y): x>y, x,y∈A} **3**

(i) Write the given relation in roster form.

(ii) Represent the given relation R by an arrow diagram.

(iii) Write the domain, range and codomain of R.

8. (i) If n (A∪B)=18, n(A-B)=5, n(B-A)=3, Find n(A∩B). **1**

(ii) Find x and y if (x-y, x+y)=(6,10) **1**

9. (i) Let R be the relation on Z defined by R = {(a,b) : a,b ∈ Z, a-b is an integer}. Find the domain and range of R. **1**

(ii) The Cartesian product A×A has 9 elements among which are find (-1,0) and (0,1). Find the set A and the remaining elements of A×A. **2**

10. (i) Draw appropriate Venn diagram for **2**

(a) $(A\cap B)^1$ (b) $A^1\cup B^1$

(b) Fill in the blanks to make each of the following a true statement. **2**

(a) $A\cup A^1$ = …… **(b) $\Phi^1\cap A$= ……**

(c) $A\cap A^1$ = …… **(d) $U^1\cap A$= ……**

11. (a) Examine whether the following statements are true or false: **2**

(i) {a} ⊂ {a,b,c} **{ii} {a,b}⊄ {b,c,a}**

(ii) {1,2,3}⊂ {1,3,5} **(iv) {b,c}⊂ {a,c,d}**

(b) Write all the subsets of the following sets

(i) Φ (ii) [1,2,3]

12. (i) In a survey of 60 people, it was found that 25 people read newspaper H, 26 read newspaper T, 26 read newspaper, I, 9 read both H and I, 11 read both H and T, 8 read both T and I, 3 read all the three newspapers. Find

(a) The number of people who read at least one of three newspaper. **3**

(b) The number of people who read exactly one newspaper.

(ii) Let ∪ {x:x ∈ Nand X≤ 8}, A = {x: $5<x^2<50$} and B={x:x is prime}. Draw a venn diagram to show the relationship between the given sets. Hence, find **2**

(a) B^1 (b) A-B. Is A-B= $A\cap B^1$