

CommClass.in F.Y.J.C Subject: Mathematics & Statistics - I Ch. 1. Sets and Relations	DATE: _____
	TIME: 1 hrs
	MARKS: 30

Q.1. (i) Write the following sets In set builder form: (2)

(a) $\{5, 10, 15, 20, 25, 30\}$

(b) $\{A, B, C, D, E\}$

(ii) Express $\{(x, y) / x^2 + y^2 = 25 \text{ where } x, y \in W\}$ as a set of ordered pairs. (2)

(iii) Determine the Domain and Range of the following relations: (2)

$$R = \{(a, b) / a \in W, a < 4, 0 \leq b < 2\}$$

Q2.

(i) If $X = \{x \in N, 0 < x \leq 8\}$, $A = \{1, 3, 5, 6\}$, $B = \{1, 2, 3, 4, 5\}$, $C = \{2, 4, 6, 8\}$, then write the sets : (a) $A \cup B$ (b) $B - C$ (c) $A \cap (B \cup C)$ (3)

(ii) If $A = \{1, 2\}$, $B = \{2, 3, 4\}$, then state the elements of $A \times A$, $A \times B$, $(A \times B) \cap (B \times A)$. (3)

(iii) if $A = \{a, b, c\}$ then write the set of all possible subsets of A. (3)

(iv) In a college, there are 25 teachers who teach Mathematics or B.K. Of these, 17 teach Mathematics and 8 teach B.K. Find number of teachers who teach both the subjects. (3)

Q3. if $A = \{4, 5, 6\}$, $B = \{1, 2, 3\}$, which of the following are relations from A to B? (4)

(a) $R_1 = \{(4,1), (5,1), (6,1)\}$

(b) $R_2 = \{(5, 1), (4, 2), (6,3)\}$

(c) $R_3 = \{(4, 1), (5,1), (6,3), (6,2), (4,3)\}$

(d) $R_4 = \{(2, 4), (6,2), (1,5), (4, 2)\}$

(ii) If $A = \{x / 6x^2 + x - 15 = 0\}$, $B = \{x / 2x^2 + 5x - 3 = 0\}$, $C = \{x / 2x^2 - x - 3 = 0\}$, then find: (4)

(a) $A \cup B \cup C$

(b) $A \cap B \cap C$

(iii) A company produces 3 kinds of products A, B and C. The company studied the preference of 160 consumers and found that the product A was liked by 125, the product B was liked by 93 and product C was liked by 100. The products A and B were liked by 65, the products B and C were liked by 61 and the products A and C were liked by 70 consumers. 3 consumers did not like any of these three products. Find the number of consumers who liked: (4)

(a) all the three products.

(b) only two of these products.
