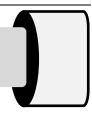## Chapter 02

Sets and Relations

📖 **Practice Section-01** 📖

Q.1 Which of the following statements is true for sets -
(1) a collection of well defined objects
(2) a collection of objects
(3) a collection of well defined objects which are distinct and distinguishable
(4) All of the above

Q.2 The set $\{x : x \in N, x$ is prime and $3 < x < 5\}$ is-
(1) $\{4\}$ (2) $\{3, 5\}$ (3) Void (4) Non – Void

Q.3 A = {a, e, i, o, u} and B = {i, o} then the true statement is-
(1) $A \subset B$ (2) $B \subset A$ (3) $A = B$ (4) A is equivalent B

Q.4 A set is defined as A = $\{x : x$ is irrational and $0.1 < x < 0.101\}$ then :
(1) A is null set (2) A is finite set (3) A is infinite set (4) none

Q.5 If A = $\{\phi, \{\phi\}\}$, then the power set of A is -
(1) A (2) $\{\phi, \{\phi\}, A\}$ (3) $\{\phi, \{\phi\}, \{\{\phi\}\}, A\}$ (4) none of these

Q.6 If A = $\{x | x^2 = 4\}$ and B = $\{x | x^2 - 5x + 6 = 0\}$ then $A \cup B$
(1) $\{2, 3\}$ (2) $\{-2, 3\}$ (3) $\{2, -3\}$ (4) $\{-2, 2, 3\}$

Q.7 Given the sets A = {1, 2, 3}, B = {3, 4}, C = {4, 5, 6}, then $A \cup (B \cap C)$ is -
(1) $\{3\}$ (2) $\{1, 2, 3, 4\}$ (3) $\{1, 2, 4, 5\}$ (4) $\{1, 2, 3, 4, 5, 6\}$

Q.8 If $N_a = \{a \, n : n \in N\}$, then $N_6 \cap N_8 =$
(1) N_6 (2) N_8 (3) N_{24} (4) N_{44}

Q.9 Which of the following is the empty set ?
(1) $\{x : x \in R$ and $x^2 + x + 1 = 0\}$ (2) $\{x : x \in R$ and $x^2 - x + 1 = 0\}$
(3) $\{x : x \in R$ and $x^2 + 2x + 1 \le 0\}$ (4) $\{x : x \in R$ and $x^2 - 2x + 1 \ge 0\}$

Q.10 Two finite sets have m and n elements respectively. The total number of subsets of first set is 56 more than the total number of subsets of the second set. The values of m and n respectively are -
(1) 7, 6 (2) 6, 3 (3) 5, 1 (4) 8, 7

Q.11 Among 1000 families of a city, 40% read newspaper A, 20% read newspaper B, 10% read newspaper C, 5% read both A and B, 3% read both B and C, 4% read A and C and 2% read all three newspapers. The number of families which read only newspaper A is-
(1) 140 (2) 290 (3) 330 (4) 340

Q.12 If for three disjoint sets A, B, C; n(A) = 10, n(B) = 6 and n(C) = 5, then n(A $\cup$ B $\cup$ C) is equal to-
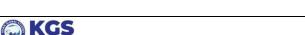(1) 21 (2) 11 (3) 1 (4) 9

📖 Practice Section-02 📖

Q.1 In the set A = {1, 2, 3, 4, 5}, a relation R is defined by R = {(x, y) | x, y ∈ A and x < y}. Then R is -
(1) Reflexive   (2) Symmetric   (3) Transitive   (4) None of these

Q.2 $x^2 = xy$ is a relation which is
(1) Symmetric   (2) Reflexive   (3) Transitive   (4) All of these

Q.3 Let *R* be a relation on a set *A* such that $R = R^{-1}$, then *R* is
(1) Reflexive   (2) Symmetric   (3) Transitive   (4) None of these

Q.4 Let *R* be a relation on *N* defined by $x + 2y = 8$. The domain of *R* is
(1) {2, 4, 8}   (2) {2, 4, 6, 8}   (3) {2, 4, 6}   (4) {1, 2, 3, 4}

Q.5 Let A = {2, 3, 4, 5} and let R = {(2, 2), (3, 3), (4, 4), (5, 5), (2, 3), (3, 2), (3, 5), (5, 3)} be a relation on A. Then
R is (1) Reflexive and transitive   (2) Reflexive and symmetric
(3) An equivalence relation   (4) None of these

Q.6 Let L be the set of all straight lines in the xy-plane. Two lines ℓ_1 and ℓ_2 are said to be related by the relation R if ℓ_1 is parallel to ℓ_2. Then the relation R is -
(1) Reflexive   (2) Symmetric   (3) Transitive   (4) Equivalence

Q.7 Given the relation R = {(2, 3), (3, 4)} on the set {2, 3, 4}. The number of minimum number of ordered pairs to be added to R so that R is reflexive and symmetric –
(1) 4   (2) 5   (3) 7   (4) 6

Q.8 Let a relation 'R' is define on 'Z' set of integers such that a R b $\Rightarrow$ a is divisible by b then 'R' is-
(1) Reflexive   (2) Symmetric   (3) Transitive   (4) Equivalence relation

ANSWER KEY

PRACTICE SECTION-01

Que.	1	2	3	4	5	6	7	8	9	10	11	12	
Ans:	3	3	2	3	3	4	2	3	1,2	2	3	1	

PRACTICE SECTION-02

Que.	1	2	3	4	5	6	7	8
Ans:	3	4	2	3	2	4	2	3