

Topics : Set, Relation & Binary Operation

Type of Questions

M.M., Min.

Single choice Objective (no negative marking) Q. 1,2,3,4,5,6,7,8,9,10 (3 marks, 3 min.) [30, 30]

- The number of proper subsets of the set  $\{1,2,3\}$  is -  
 (A) 8 (B) 7 (C) 6 (D) 5
- If  $N_a = \{an ; n \in \mathbb{N}\}$ , then the set  $N_5 \cap N_7 =$   
 (A)  $N_7$  (B)  $N_5$  (C)  $N_{35}$  (D)  $N_{12}$
- A class has 175 students. The following data shows the number of students offering one or more subjects : Mathematics 100, Physics 70, Chemistry 40, Mathematics and Physics 30, Mathematics and Chemistry 28, Physics and Chemistry 23, Mathematics, Physics and Chemistry 18. How many student have offered Mathematics alone ?  
 (A) 35 (B) 48 (C) 60 (D) 22
- Let  $A = \{1, 2, 3\}$  and  $B = \{2, 3, 4\}$ , then which of the following relation is a function from A to B.  
 (A)  $\{(1, 2), (2, 3), (3, 4), (2, 2)\}$  (B)  $\{(1, 2), (2, 3), (1, 3)\}$   
 (C)  $\{(1, 3), (2, 3), (3, 3)\}$  (D)  $\{(1, 1), (2, 3), (3, 4)\}$
- Let R be a relation on the set of integers given by  $aRb \Rightarrow a = 2^k \cdot b$  for some integer k. then R is  
 (A) An equivalence relation (B) Reflexive but not symmetric  
 (C) Reflexive and transitive (D) Reflexive and symmetric but not transitive
- If A is the set of even natural numbers less than 8 and B is the set of prime numbers less than 7, then the number of relations from A to B is  
 (A)  $2^9$  (B)  $9^2$  (C)  $3^2$  (D)  $2^9 - 1$
- Let S be the set of all real numbers. Then the relation  $R = \{(a, b) : 1 + ab > 0\}$  on S is  
 (A) An equivalence relations (B) Reflexive but not symmetric  
 (C) Reflexive and transitive (D) Reflexive and symmetric but not transitive
- Which of the following binary operations is commutative :  
 (A) \* on R, given by  $a * b = ab^2$   
 (B) \* on R, given by  $a * b = a^b$   
 (C) \* on P(S), the power set of a set S given by  $A * B = A \Delta B$   
 (D) None of these
- A binary operation \* is defined on the set of real number by  $a * b = 1 + ab$ . then the operation \* is  
 (A) Commutative but not associative (B) Associative but not commutative  
 (C) Both commutative and associative (D) Neither commutative nor associative
- Let z be the set of integers and \* be a binary operation on z defined by  $a * b = a + b - ab$  for all  $a, b \in z$ . The inverse of an element  $a (a \neq 1) \in z$  is  
 (A)  $\frac{a}{a-1}$  (B)  $\frac{a}{1-a}$  (C)  $\frac{1-a}{a}$  (D) None of these



# Answers Key

1. (B)      2. (C)      3. (C)      4. (C)  
5. (A)      6. (A)      7. (D)      8. (C)  
9. (A)      10. (A)