**MATHEMATICS**

**DPP**

DAILY PRACTICE PROBLEMS

# DPP No. 40

**Total Marks : 30**

**Max. Time : 30 min.**

**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]**

**1.** The number of proper subsets of the set {1,2,3} is -

(A) 8 (B) 7 (C) 6 (D) 5

**2.** If $N_a = \{an ; n \in N\}$, then the set $N_5 \cap N_7 =$

(A) $N_7$ (B) $N_5$ (C) $N_{35}$ (D) $N_{12}$

**3.** 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

**4.** 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)}

**5.** Let R be a relation on the set of integers given by aRb $\Rightarrow$ $a = 2^K.b$ 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

**6.** 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) $2^9 - 1$

**7.** 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

**8.** 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

**9.** 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

**10.** 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 ($\neq$ 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

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