Roll No. | | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 08

M.Sc. (IT) / MCA / PGDCA (2019 Batch) (Sem.–1)

MATHEMATICS

Subject Code : PGCA-1901

M.Code : 76971

Time : 2 Hrs. **Max. Marks : 35**

INSTRUCTIONS TO CANDIDATES :

1. **Attempt any FIVE question(s), each question carries 7 marks.**

1. Is 2352 is perfect square? If not find smallest multiple of 2352 which is perfect square. Find square root of the new number.

2. a) Find cube root of 13824.

   b) Find the value of $\frac{\sqrt[3]{729} - \sqrt[3]{27}}{\sqrt[2]{144} + \sqrt[3]{64}}$.

3. a) Show that if A and B are any two sets, then prove that $A - B = A - (A \cap B)$.

   b) Which of the following sets are equal?

   $A = \{x : x^2 + 5x + 6 = 0, x - 3 = 0\}$, $B = \{x : x \in N, x < 5\}$, $C = \{x : x \in N, x$ is a prime number $< 5\}$.

4. a) How many subsets can be formed from a set of n elements ? How many of these will be proper and how many improper?

   b) Define symmetric difference of sets? Also find the symmetric difference of A = {1, 2, 3, 4, 5, 6} and B = {4, 5, 6, 7, 8, 9}.

5. a) Prove that $p \vee \sim (p \wedge q)$ is tautology.

   b) State and prove De-Morgan's law with help of Logics.

6. a) Show that $(p \wedge q) \downarrow r$ and $(p \downarrow r) \wedge (q \downarrow r)$ are not equivalent.

   b) Determine whether $(\sim q \wedge (p \downarrow q)) \equiv \sim p$.

7. a) If $A = \begin{vmatrix} 1 & 5 \\ 7 & 12 \end{vmatrix}$ and $B = \begin{vmatrix} 9 & 1 \\ 7 & 8 \end{vmatrix}$, Find matrix C such that $A - 5B + C = I$, where I is identity matrix.

   b) State and prove two properties of Transpose of a matrices.

8. a) Given that $A = \begin{vmatrix} 2 & 3 \\ 1 & 4 \end{vmatrix}$ $\begin{vmatrix} 0 & 1 & 4 \\ 3 & 2 & 0 \end{vmatrix}$, Find $A|B$ and $B|A$. Is $A|B|$ is defined.

b) If $A = \begin{vmatrix} 1 & 2 \\ 2 & 3 \end{vmatrix}$ $\begin{vmatrix} 3 & 0 \\ 0 & 3 \end{vmatrix}$, Is it true $(A + B)^2 = A^2 + B^2 + 2AB$.