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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  $\frac{\sqrt[3]{729} \sqrt[3]{144}}{\sqrt[3]{27} \sqrt[3]{64}}$ .
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?  
 $A = \{x : x^2 + 5x + 6 = 0, x - 3 = 0\}$ ,  $B = \{x : x \in \mathbb{N}, x < 5\}$ ,  $C = \{x : x \in \mathbb{N}, x \text{ is a prime number} < 5\}$ .
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  $p \vee \sim (p \cap q)$  is tautology.  
b) State and prove De-Morgan's law with help of Logics.
6. a) Show that  $(p \cap q) \cap r$  and  $(p \cap r) \cap (q \cap r)$  are not equivalent.  
b) Determine whether  $(\sim q \cap (p \cap q)) \cap \sim p$ .
7. a) If  $A = \begin{bmatrix} 1 & 5 \\ 7 & 12 \end{bmatrix}$  and  $B = \begin{bmatrix} 9 & 1 \\ 7 & 8 \end{bmatrix}$ , 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  $A = \begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}$ ,  $B = \begin{bmatrix} 0 & 1 & 4 \\ 3 & 2 & 0 \end{bmatrix}$ , Find  $A \cdot B$  and  $B \cdot A$ . Is  $A \cdot B$  is defined.

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

Note: Any student found attempting answer sheet from any other person(s), using incriminating material or involved in any wrong activity reported by evaluator shall be treated under UMC provisions. Student found sharing the question paper(s)/answer sheet on digital media or with any other person or any organization/institution shall also be treated under UMC. Any student found making any change/addition/modification in contents of scanned copy of answer sheet and original answer sheet, shall be covered under UMC provisions.