

Roll No.

Total No. of Pages : 02

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B.Sc. (IT)/ BCA (2019 Batch)/BBA (Sem.-1)

B.Sc.(Graphics & Web Designing)

**MATHEMATICS**

Subject Code : UGCA1901

M.Code : 76961

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

**SECTION-A**

1. Write briefly :

- a) Define Disjoints set and Equivalent sets.
- b) If  $A = \{1, 2, 3\}$  and  $B = \{1, 5, 7\}$ , determine the following sets :
  - i)  $A - B$
  - ii)  $A \bar{\cap} B$
- c) Define Symmetric difference of sets using diagram.
- d) Find component statement of “*Number 7 is prime and odd*”.
- e) Translate statement in to symbolic form “*2, 3 and 6 are factors of 12*”.
- f) Define Null and Scalar matrix

g) If 
$$\begin{bmatrix} 2 & 1 & 3 \\ 0 & 1 & 1 \end{bmatrix} \begin{bmatrix} -1 & 0 & -1 \\ 1 & 1 & 0 \\ 0 & 1 & 1 \end{bmatrix} \begin{bmatrix} 1 \\ 0 \\ -1 \end{bmatrix} = A$$
, Find A.

- h) If  $a, b$  and  $c$  are in A.P. then show that  $2b = a + c$
- i) Give an example of a sequence which is A.P. and G.P. together.
- j) Determine  $k$  so that  $k + 2, 4k - 6, 3k - 2$  are the three consecutive terms of an A.P.

**SECTION-B**

2. a) Write the following sets in roaster form : 6
- i)  $A = \{x : x \text{ is positive factor of } 36\}$
- ii)  $B = \{x : x \in \mathcal{R}, 2x + 11 = 25\}$
- iii)  $C = \left\{ \begin{matrix} \text{(a)} \\ \text{(b)} \\ \text{(c)} \end{matrix} : \frac{x-2}{x+3} = 3, x \in \mathcal{R} \right\}$
- b) Given that  $L = \{1, 2, 3, 4\}$ ,  $M = \{3, 4, 5, 6\}$  and  $N = \{1, 3, 5\}$ , Verify that  $L - (M \cup N) = (L - M) \cap (L - N)$ . 4
3. Write the following equation in Symbolic form and find its negation : 10
- “If he is Good in studies then he will either do M.B.A. or M.C.A.”
4. a) If  $2A + 3B = \begin{pmatrix} 1 & -2 & 3 \\ 2 & 0 & -1 \end{pmatrix}$  and  $A - 2B = \begin{pmatrix} 3 & 0 & 1 \\ -1 & 6 & 2 \end{pmatrix}$ , then find A and B. 5
- b) If  $A = \begin{pmatrix} 2 & -2 \\ 3 & 2 \end{pmatrix}$ , then show that  $(A + I)(A - 4I) = 0$ . 5
5. a) The third term of an A.P. is 1 and 6<sup>th</sup> term is -11. Determine the 11<sup>th</sup> term and  $m$ th term. 5
- b) Insert three Geometric means between 1 and 256. 5
6. a) If  $A = \begin{pmatrix} 2 & 0 \\ 2 & 3 \\ -1 & 0 \end{pmatrix}$ , compute  $A^2 - 3A + 2I$ . 6
- b) Define negation and Tautology with examples. 4
7. a) If  $m$  times the  $m$ th term of an A.P. is equal to  $n$  times the  $n$ th term, show that the  $(m + n)$ th term of the A.P. is zero. 6
- b) In each of the following, determine whether the statement is true or false. If it is true, prove it. If it is false, give an example. 4
- i) If  $x \in A$  and  $A \subseteq B$ , then  $x \in B$ .
- ii) If  $A \cap B$  and  $B \subseteq C$ , then  $A \subseteq C$ .

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**