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B.Sc. (IT)/ Graphics & Web Designing / BCA (Sem-1)

**MATHEMATICS**

Subject Code : UGCA-1901

M.Code : 76961

Date of Examination : 17-06-2023

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) Set builder method

b) Null set

c) Disjunction

d) Contradiction

e) Diagonal matrix

f) Arithmetic progression

g) Geometric mean

h) Show that  $AUA^c = U$

i) If  $A = \begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$ ,  $B = \begin{bmatrix} 1 & -1 \\ -3 & 0 \end{bmatrix}$ , find  $5A - 3B$ .

j) Prove by an example that  $AB$  can be zero matrix when either of  $A$  and  $B$  is zero matrix.

## SECTION-B

2. a) Let  $U = \{0, 1, 2, 3, \dots, 9\}$ ,  $A = \{x \in U : x \text{ is multiple of } 3\}$ ,  $B = \{x \in U : x^2 - 5 \geq 0\}$ . Determine

i)  $A \cap B$

ii)  $A \cup B$

b) List all the members of the power set of the set  $A = \{a, b, c, d\}$ .

3. Prove  $p \wedge (q \vee r) = (p \wedge q) \vee (p \wedge r)$

4. For what values of  $x, y, z, w$

$$3 \begin{bmatrix} x & y \\ z & w \end{bmatrix} = \begin{bmatrix} x & i \\ -1 & 2w \end{bmatrix} + \begin{bmatrix} 4 & x+y \\ z+w & 3 \end{bmatrix}$$

5. If  $A = \begin{bmatrix} 1 & 0 & 2 \\ -1 & 2 & -3 \end{bmatrix}$ ,  $B = \begin{bmatrix} 2 & 0 \\ 1 & -1 \\ 0 & -2 \end{bmatrix}$  verify that  $(AB)' = B'A'$ .

6. a) Prove that if  $a, b, c$  are in AP. then  $a^2(b+c), b^2(c+a), c^2(a+b)$  are in AP

b) Insert 5 AMs between 9 and 27.

7. a) The sum of three terms of a GP is 21 and their product is 216. Find the terms.

b) Insert 5 GMs between 3 and 192.

**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.**