

Roll No.

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

MATHEMATICS

Subject Code : UGCA1901

M.Code : 76961

Date of Examination: 18-12-2024

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:

- Roaster method
- Singleton set
- Prove that $A \setminus B$ and $B \setminus A$ are disjoint.
- Conjunction
- Tautology
- Scalar matrix
- Arithmetic mean
- Geometric progression
- If $A = \begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 \\ -3 & 0 \end{bmatrix}$, find $3A - 2B$
- Prove by an example that AB can be zero matrix when either of A and B is zero matrix.

SECTION-B

2. a) Let $A = \{0, 2, 3\}$, $B = \{2, 3\}$ and $C = \{1, 5, 9\}$ and let the universal set $U = \{0, 1, 2, 3, \dots, 9\}$. Determine
 - i) $A \cup B$,
 - ii) $A \cap C$,
 - iii) $A - B$,
 - iv) A^C ,
 - v) $(B \cap C)^C$.
- b) List all the members of the power set of the set $A = \{a, b, 2, 3\}$
3. a) Define logical and compound statements with examples of each.
- b) Prove that $(p \wedge q) \rightarrow (p \vee q)$ is tautology.
4. For what values of x, y, z, w

$$3 \begin{bmatrix} x & y \\ z & w \end{bmatrix} = \begin{bmatrix} x & 1 \\ -1 & 2w \end{bmatrix} + \begin{bmatrix} 4 & x+y \\ z+w & 3 \end{bmatrix}$$
5. Verify that $(AB)' = B'A'$, if $A = \begin{bmatrix} 2 & 1 & 3 \\ 4 & 1 & 0 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 \\ 0 & 2 \\ 5 & 0 \end{bmatrix}$
6. a) Prove that if a, b, c are in AP, then $b^2 + c + bc, c^2 + a^2 + ca, a^2 + b^2 + ab$ are AP.
- b) Insert 5 AMs between 9 and 27.
7. a) The fifth term of a GP is 81 and the second term is 24, find the series.
- 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.