

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Total No. of Pages : 02

Total No. of Questions : 07

B.Sc. (Computer Science) (2013 & Onwards) (Sem.-1)

ALGEBRA

Subject Code : BCS-101

M.Code : 70878

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 Transpose of the matrix.
- (b) Define Orthogonal Matrix.
- (c) Define Hermitian Matrix.
- (d) Find the rank of the matrix : $\begin{bmatrix} 2 & 4 \\ 5 & 3 \end{bmatrix}$
- (e) Find the inverse of the matrix : $\begin{bmatrix} -1 & 5 \\ 4 & -3 \end{bmatrix}$
- (f) Define Column Rank.
- (g) Prove that the row rank of a matrix is the same as its rank.
- (h) State conditions under which a set of homogenous equations possess a trivial solution?
- (i) Define Nullity of a Matrix.
- (j) If X be an eigen vector of the n-rowed square matrix A over a field F, then X cannot correspond to two distinct eigen values.

SECTION-B

2. Use Ferrari's method to solve $x^4 - 8x^3 + 11x^2 + 20x + 4 = 0$.

3. Use Cardan's method to solve $2x^3 - 7x^2 + 8x - 3 = 0$.

4. Use Descartes's method to solve $x^4 - 2x^2 + 8x - 3 = 0$.

5. State and prove Cayley Hamilton theorem.

6. Find all the eigen values and vectors of the matrix $\begin{bmatrix} 3 & 1 & 4 \\ 0 & 2 & 6 \\ 0 & 0 & 5 \end{bmatrix}$

7. Find the minimal polynomial of the matrix $\begin{bmatrix} 1 & -2 & 3 \\ 0 & 5 & -3 \\ 0 & 0 & -2 \end{bmatrix}$

NOTE : Disclosure of identity by writing mobile number or making passing request on any page of Answer sheet will lead to UMC case against the Student.