

07/10/14

VCD - F.Y. I.T. APPLIED MATHS I - SEM I - 75 MARKS - 2 ½ HRS

Right indicates full marks

All questions are compulsory

Solve the following. (any two)

(10)

- a) Find
- A^{-1}
- by Inversion method

$$\text{If } A = \begin{bmatrix} 1 & -3 & 2 \\ 2 & 0 & 0 \\ 1 & 4 & 1 \end{bmatrix}$$

- b) Check following vectors are linearly Dependent or Independent if

$$X_1 = [1 \ 0 \ 2 \ 1] \ [3 \ 1 \ 2 \ 1] \ [4 \ 6 \ 2 \ -4] \ [-6 \ 0 \ -3 \ -4]$$

- c) Test for consistency the following equation and if possible solve them.

$$x_1 - x_2 + x_3 - x_4 = 1; \ 2x_1 - x_2 + 3x_3 = 2; \ 3x_1 - 2x_2 + 2x_3 + x_4 = 1; \ x_1 + x_3 + 2x_4 = 0$$

- d) Find Rank of following matrix (i) by normal form and matrix (ii) by echelon form

$$\text{i) } \begin{bmatrix} 1 & 2 & 3 & -1 \\ -2 & -1 & -3 & 1 \\ 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & -1 \end{bmatrix} \quad \text{ii) } \begin{bmatrix} 1 & 3 & 2 & 2 \\ 1 & 2 & 1 & 3 \\ 2 & 4 & 3 & 4 \\ 3 & 7 & 4 & 8 \end{bmatrix}$$

(10)

Solve the following. (any two)

- a) Find Eigen value and Eigen vector of following matrix

$$A = \begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$$

- b) Verify Caley's theorem

$$A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$$