MAS 1435 TIME: 3hrs

MATHS FOR CHIMISTRY- I MAX: 75

ANSWER ANY FIVE QUESTIONS: 5x15=75

1. (a) Find the inverse of the matrix $A = \begin{bmatrix} 1 & 0 & 2 \\ 3 & 1 & -1 \\ -2 & 1 & 3 \end{bmatrix}$ by using Elementary transformations.

    (b) Find the rank of the matrix $A = \begin{pmatrix} 1 & 1 & 1 & 1 \\ 4 & 1 & 0 & 2 \\ 0 & 3 & 4 & 2 \end{pmatrix}$ by examining the determinant minirs.

2. Find the eigen values and eigen vectors of the matrix $A = \begin{pmatrix} 2 & -2 & 2 \\ 1 & 1 & 1 \\ 1 & 3 & -1 \end{pmatrix}$

3. Using Cayley's Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & 0 & -2 \\ 2 & 2 & 4 \\ 0 & 0 & 2 \end{bmatrix}$ find (i) A^{-1} (ii) A^4 .

4. (a) Let G be the set of all real numbers except -1. Define $*$ on G by $a*b = a+ b + ab$. Prove that $(G, *)$ is a Group.

    (b) Show that $f: R - \{3\} \to R - \{1\}$ given by $f(x) = \frac{x-2}{x-3}$ is a bijection and find its inverse.

5. A group of 10 rats fed on a diet A and another group of 8 rats fed on a different diet B recorded. The following increases in weights in gms.

Diet A	5	6	8	1	12	4	3	9	6	10
Diet B	2	3	6	8	1	10	2	8	-	-

    Test whether diet A is superior to diet B.(Table value for the d.f 16 is 2.12)

6. Find the real root of the equation $f(x) = x^3 - 3x - 5 = 0$ using method of false position.

7. A function $y = f(x)$ is given by the following table. Find $f(0,2)$ by using Newton's forward interpolation formula.

x	0	1	2	3	4	5	6
$y = f(x)$	176	185	194	203	212	220	229

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