Dr.SNS RAJALAKSHMI COLLEGE OF ARTS & SCIENCE
CIA-I EXAMINATIONS August 2023
(First Semester)
UG COMPUTER STUDIES
Computational Mathematics(21UCU301)

Time: Three Hours **Maximum: 75 Marks**

SECTION - A (5x5=25 Marks)
Answer **ALL** Questions
ALL Carry **EQUAL** Marks

1. a) If $A=\begin{bmatrix} 3 & 2 \\ -6 & -4 \end{bmatrix}$ and $B=\begin{bmatrix} 3 & -2 \\ 4 & 5 \end{bmatrix}$ then find A-B. (OR)

   b) Find the value of the determinant $A=\begin{vmatrix} 3 & 2 \\ 6 & 4 \end{vmatrix}$

2. a) Find 6A, if $A=\begin{bmatrix} 2 & 4 & 4 \\ 3 & 7 & 6 \\ 2 & 8 & 0 \\ 5 & 3 & 1 \end{bmatrix}$ (OR)

   b) Find the rank of the matrix $A=\begin{bmatrix} 3 & 2 \\ 6 & 5 \end{bmatrix}$

3. a) Find the Transpose of the matrix $A=\begin{bmatrix} 5 & 8 & 9 & 3 \\ 7 & 4 & 5 & 0 \\ 2 & 6 & 8 & 5 \\ 1 & 6 & 8 & 4 \\ 5 & 6 & 0 & 2 \end{bmatrix}$ (OR)

   b) If $A=\begin{bmatrix} 4 & -2 \\ 3 & -1 \end{bmatrix}$ and $B=\begin{bmatrix} 2 & 4 \\ 3 & 6 \end{bmatrix}$, then find AB.

4. a) If $A=\begin{bmatrix} 3 & 2 \\ -6 & -4 \end{bmatrix}$ and $B=\begin{bmatrix} 3 & -2 \\ 4 & 5 \end{bmatrix}$ then find A+B. (OR)

   b) Find the value of the determinant $A=\begin{vmatrix} 3 & 2 \\ 1 & 5 \end{vmatrix}$

5. a) Write down the formulae for Bisection method and Regula Falsi method. (OR)

   b) Compute x_3 for the equation $x^3-4x-9=0$ using Bisection method.

SECTION - B (5x8=40 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks

6. a) Find the value of the determinant $A=\begin{bmatrix}3 & -2 & 1\\ 2 & 3 & -1\\ 1 & 1 & 1\end{bmatrix}$ (OR)

   b) If $A=\begin{bmatrix}4 & -1 & 0\\ -3 & 5 & -6\\ 2 & -7 & 8\end{bmatrix}$ and $B=\begin{bmatrix}-1 & 0 & 1\\ 5 & -2 & 2\\ 3 & 4 & 3\end{bmatrix}$, then find A+B and A-B

7. a) Find the rank of the matrix $A=\begin{bmatrix}-2 & 1 & 3 & 4\\ 0 & 1 & 1 & 2\\ 1 & 3 & 4 & 7\end{bmatrix}$ (OR)

   b) If $A=\begin{bmatrix}1 & 2 & 4\\ 0 & 9 & 8\\ 5 & 7 & 6\end{bmatrix}$, $B=\begin{bmatrix}10 & 4 & 1\\ -3 & 7 & 3\\ 14 & 5 & 9\end{bmatrix}$ and $C=\begin{bmatrix}1 & 0 & 3\\ 3 & 2 & 5\\ 6 & 5 & 9\end{bmatrix}$, then show that (A+B)+C=A+(B+C).

8. a) If $A=\begin{bmatrix}3 & 1\\ -1 & 2\end{bmatrix}$. Show that $A^2-5A+7I_2=0$. (OR)

   b) Find the rank of $A=\begin{bmatrix}3 & 2 & -1\\ 7 & 8 & 0\\ 4 & 6 & 1\end{bmatrix}$

9. a) If $A=\begin{bmatrix}1 & 2\\ 3 & 4\end{bmatrix}$ and $B=\begin{bmatrix}5 & 6\\ 7 & 8\end{bmatrix}$, then find AB. (OR)

   b) If $A=\begin{bmatrix}2 & 3 & 5\\ 4 & 7 & 9\\ 1 & 6 & 4\end{bmatrix}$ and $B=\begin{bmatrix}3 & 1 & 2\\ 4 & 2 & 5\\ 6 & -2 & 7\end{bmatrix}$. Find 5A+5B.

10. a) Find the root of the equation upto 5 iteration $x^3-4x-9=0$ by using Bisection method. (OR)

    b) Find the root of the equation upto 5 iteration $x^3-3x-1=0$ by using Bisection method.

SECTION- C (1x10=10 Marks)

(Compulsory)

11. If $A=\begin{bmatrix}4 & 3 & 2\\ 5 & 2 & 2\\ 2 & 3 & -1\end{bmatrix}$ and $A=\begin{bmatrix}1 & 2 & 1\\ -2 & 3 & 4\\ 3 & -3 & 2\end{bmatrix}$, then show that $(A+B)^T=A^T+B^T$