B.Sc. DEGREE EXAMINATION,NOVEMBER 2019
III Year V Semester
Numerical Methods

Time : 3 Hours **Max.marks :60**

Section A $(10 \times 1 = 10)$ Marks

Answer any **TEN** questions

1. Show that every non singular square matrix has a unique inverse.
2. Compare the merits and demerits of the elimination method and iterative method in solving linear algebraic equations.
3. What are the disadvantages of bisection method?
4. How will you solve differential equation by Euler's method?
5. What is the difference between interpolation and extrapolation?
6. What is meant by truncation error interpolation?
7. Explain the principle of least squares fit.
8. What the desirable characteristics of matrix used for curve fitting method?
9. Mention two practical applications of simpson's rule for numerical intergration.
10. State Trapezoidal rule to evaluate $\int_{\mathbf{x}o}^{\mathbf{x}n} \mathbf{y}(\mathbf{x})\mathbf{d}x$.
11. Find the inverse of the following matrix $\begin{bmatrix} \mathbf{c}os \propto & \mathbf{s}in \propto \\ \mathbf{s}in \propto & \mathbf{c}os \propto \end{bmatrix}$
12. Write the formula for Newton's forward interpolation scheme.

Section B $(5 \times 4 = 20)$ Marks

Answer any **FIVE** questions

13. Explain the principle of Gauss Jordan Method.
14. Define the operator E and δ and derive the relation between them.
15. State and explain linear regression.
16. Explain Newton's backward interpolation scheme.
17. Write down the procedure for finding the approximate root by bisection.
18. Explain Horner's method of solving an equation of the form f(x)=0.
19. Describe simpson's rule for evaluation an integral.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. Solve the following system of equations by Gauss elimination method.

    $x_1 + x_2 = 2$; $3x_1 - 10x_2 = 3$.

21. Solve the following equation using Newton Raphson Method sinx = 1-x

22. The following data represent the function f(x) = e^x. Estimate the value of f(2.25) using interpolation. Compare with the exact value.

x	1	1.5	2 .0	2.5
f(x)	2.7183	4.4817	7.3891	12.1825

23. Evaluate the integral $I = \int_0^1 \mathbf{d}x/(\mathbf{1}+\mathbf{x})$using trapezoidal rule. Choose h = 0.25

24. Find the least squares straight line fit for the following data.

x:	1	2	3	4
y:	1.7	1.8	2.3	3.2

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