M.Sc. DEGREE EXAMINATION,NOVEMBER 2019
I Year II Semester
Computational Methods and C Programming

Time : 3 Hours **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. Write the formula for Newton Raphson method?
2. What is meant by zero's of polynomial?
3. Name the iterative method to find largest eigen value?
4. Is convergence possible in Gauss elimination method? Why?
5. State Newton's forward interpolation formula.
6. Write the principle of least squares.
7. Give the formula for Runge Kutta method.
8. Write the formula for of simpson's $\frac{1}{3}^{rd}$ rule.
9. What is a flow chart?
10. What are Built-in functions in C?
11. State lagrange's interpolation formula.
12. Give the significance of Euler method.

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. Derive Newton Raphson's formula.
14. Find the solutions of the system:2x+3y-z=5, 4x+4y-3z=3, 2x-3y+2z=2 by Gauss-Elimination method.
15. Use Lagrange's interpolation formula to find y(9.5) given

X	7	8	9	10
Y	3	1	1	9

16. Explain the theory of trapezoidal rule and derive truncation error.
17. Write a 'C' program to find the value of the integral $\int_0^1 e^x dx$ between the limits 0 to 1 using Simpson's one third rule.
18. Solve the equation dy/dx=1-y, given y(0)=0 using modified Euler method and tabulate the solution for x=0.1, 0.2 and 0.3
19. Evaluate the real root of the equation, x^4-3x+1 =0 by bisection method.

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

Answer any **THREE** questions

20. Find the positive root of equation f(x) = $2x^2$-3x-6=0 by Newton Raphson method corrected to five decimal places.

21. Find the dominant eigen value and corresponding eigen vector of

$$A = \begin{pmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{pmatrix}$$

22. Fit a parabola y=a+bx+cx^2 using least squares method given that

X	0	1	2	3	4
Y	1	1.8	1.3	2.5	6.3

23. Solve dy/dx=1/(x+y) for x=0.5 to 1.5 in steps of 0.5 by using Runge-kutta method, with x_0=0 and y_0=1.

24. Write a 'C' program to find the root of equation between 0 to 1 of x^3=6x-4 corrected to 5 decimal places using Newton Rapson method

M.Sc. DEGREE EXAMINATION,NOVEMBER 2019
I Year II Semester
Computational Methods and C Programming

Time : 3 Hours **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. Write the formula for Newton Raphson method?
2. What is meant by zero's of polynomial?
3. Name the iterative method to find largest eigen value?
4. Is convergence possible in Gauss elimination method? Why?
5. State Newton's forward interpolation formula.
6. Write the principle of least squares.
7. Give the formula for Runge Kutta method.
8. Write the formula for of simpson's $\frac{1}{3}^{rd}$ rule.
9. What is a flow chart?
10. What are Built-in functions in C?
11. State lagrange's interpolation formula.
12. Give the significance of Euler method.

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. Derive Newton Raphson's formula.
14. Find the solutions of the system:2x+3y-z=5, 4x+4y-3z=3, 2x-3y+2z=2 by Gauss-Elimination method.
15. Use Lagrange's interpolation formula to find y(9.5) given

X	7	8	9	10
Y	3	1	1	9

16. Explain the theory of trapezoidal rule and derive truncation error.
17. Write a 'C' program to find the value of the integral $\int_0^1 e^x dx$ between the limits 0 to 1 using Simpson's one third rule.
18. Solve the equation dy/dx=1-y, given y(0)=0 using modified Euler method and tabulate the solution for x=0.1, 0.2 and 0.3
19. Evaluate the real root of the equation, x^4-3x+1 =0 by bisection method.

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

Answer any **THREE** questions

20. Find the positive root of equation f(x) = $2x^2$-3x-6=0 by Newton Raphson method corrected to five decimal places.

21. Find the dominant eigen value and corresponding eigen vector of

$$A = \begin{pmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{pmatrix}$$

22. Fit a parabola y=a+bx+cx^2 using least squares method given that

X	0	1	2	3	4
Y	1	1.8	1.3	2.5	6.3

23. Solve dy/dx=1/(x+y) for x=0.5 to 1.5 in steps of 0.5 by using Runge-kutta method, with x_0=0 and y_0=1.

24. Write a 'C' program to find the root of equation between 0 to 1 of x^3=6x-4 corrected to 5 decimal places using Newton Rapson method