M.Sc DEGREE EXAMINATION,APRIL 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. What is a symmetric matrix? Give an example.
2. What are the differences between Jacobi method and power method of finding eigen values and eigen vectors?
3. Write down the normal equations for fitting a parabola by least squares method.
4. Define interpolation and extrapolation.
5. Give the formulae for numerical differentiation based on Newton's forward and backward interpolation methods.
6. What are the truncation errors in trapezoidal and Simpson rule?
7. What is the output of the following program (when run under turbo C)

   main()

   {

   char *p = "aygm";

   char c;

   c = ++*p++;

   printf("%c",c);
8. Will this program compile?

   main(){printf("Hello World");};;;
9. write the program to find the sum s = 1 + 2 + 3 + 4 + 5 + ... +100.
10. what is flow chart?
11. Give the Runge kutta kutta second order, third order and fourth order equations.
12. Give examples for integral and floating point arithmetic expressions

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

Answer any **FIVE** questions

13. Give the theory of bisection method of finding the root of an equation.

14. Find a straight line fit of the form y= a+bx by the method of group averages for the following data:

x	0	5	10	15	20	25
y	12	15	17	22	24	30

15. Give the theory of Gauss elimination method of solving simultaneous equations.
16. Explain Simpson rule?
17. Using Lagrange's interpolation method find the value of the function f(x) at x = 40.
    x : 30 35 45 55
    f(x) : 148 96 68 34
18. What are executable and non executable statements? Give examples.
19. Write a program in C to evaluate $\int x^3\,dx$ by Simpson's one-third rule with limit a to b.

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

Answer any **THREE** questions

20. Find the root of the equation $x^3 - 4x + 9 = 0$ by bisection method.
21. Drive an expression for an Eignenvalues and eigenvectors of matrices.
22. Solve the any system of equations by Gauss elimination method.
23. Derive an expression for Trapezoidal rule.
24. Write C program for Solution of first order differential equations by Euler's method.

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