Number of Questions: 16
Number of Printed Pages : 02

BG 5th SEMESTER

NUMERICAL METHODS [BCA]

Time Allowed : 2.00 Hours

Max. Marks : 60
Min. Marks : 24

NOTE: Attempt all Questions from Section "A" & "B" and Only Two Questions from Section C:

SECTION – A : (Short Answer Type Questions to be answered in about 20 words) (8 × 3 = 24 Marks)

1. Write short notes on the following:
   a) Round-Off Error
   b) Truncation Error
   c) Significant Digits
2. Using Regula Falsi Method perform two iterations to find the root of equation:
   $f(x) = x^3 + 4x^2 - 10 = 0$
3. Using Newton Raphson Method, find the square root of 10 with initial approximation X_0=3
4. Give the Floating point representation of following numbers in 4 decimal digit floating point number using Truncation:
   a) 37.21829
   b) 0.022718
   c) 3000527.11059
5. Write an Algorithm to implement Jacobi Method.
6. What is difference between Lagrange's form of interpolating polynomial and Newton's form of Interpolating polynomial?
7. What is the difference between Gauss Elimination and Gauss Jardan method?
8. Write General Formulae's of Newton's Forwarded and Backward Difference Tables.

SECTION – B : (Medium Answer Type Questions to be answered in about 150 words) (4 × 5 = 20 Marks)

9. Write a program in C/C++/Fortran to implement Gauss Thomas Method for tridiagonal systems.

   OR

   Write a program in C/C++/Fortran to implement Euler's method.

10. The Equation $2x^3 + 5x^2 + 5x + 3 = 0$ has root in the interval [-2, -1]. Perform three iterations using false position method to find the root of the equation.

    OR

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Find the approximate value of 1/15 using Newton Raphson Method with the initial approximation X_0=0.02

11. Using Gauss Elimination Method solve the following system of Equations:

$$x+2y+z=3$$
$$3x+2y+z=3$$
$$x-2y-5z=1$$

OR

Perform four iteration using Gauss Siedil method for following system of equations.

$$-8x1+x2=x3=1$$
$$x1-5x2-x3=16$$
$$x1+x2-4x3=7$$

12. Write a program segment in C/C++/Fortran to implement Euler's method.

OR

Write a program segment in C/C++/Fortran to implement Euler's Modified method.

SECTION – C: {Long Answer Type Questions to be answered in about 300 words} (2 × 08 = 16 Marks)

13. Solve the following equation using Bisection Method:

$$2x^3+5x^2+5x+3=0$$

14. If $f(1)=-3, f(3)=9, f(4)=30, f(6)=132,$ find the Lagrange's interpolation polynomial of $f(x)$. Also find the value of f $when x=5.$

15. Find the Newton's Backward difference interpolating polynomial which agrees with the table of values given below. Hence obtain the value of $f(x)$ at $x=5.5$

X	1	2	3	4	5	6
$f(x)$	10	19	40	79	142	235

16. Find and approximation to $\int_{1.1}^{1.5} e^x dx$ using Simpson's rule with $h=0.2.$

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