K16U 0119

Reg. No.: .....

Name: .....

VI Semester B.C.A. Degree (CCSS – Reg./Supple./Improv.) Examination, May 2016
Core Course – Section A – Elective
6B21 BCA (E05) : NUMERICAL METHODS

Time : 3 Hours Max. Weightage : 21

SECTION – A

Answer **all** questions. Weightage for a bunch of **four** questions is 1.

1. The difference between true value and approximate value is
   a) output error b) relative error
   c) absolute error d) none

2. The Regular Falsi method is also known as
   a) Interval halving b) Binary search
   c) Newtons method d) False position method

3. The equation $y_{i+1,}p = y_i + hf(x_i, y_i)$ is called the
   a) Predictor formula b) Simpsons rule
   c) Eulers formula d) None

4. The second order Runge Kutta formula is also known as
   a) Predictor formula b) Newtons method
   c) Heun's method d) None

5. In _____ we approximate the curve of solution by the tangent in each interval.
   a) Picard's b) Eulers method c) Newton d) None

6. Convergence of the bisection method is sure and
   a) fast b) slow c) moderate d) none

P.T.O.

7. Euler's method is a Taylor's series method of _____ order.
   a) 1 b) 2 c) 3 d) 0

8. Convergence of Newton Raphson method is
   a) linear b) quadratic c) cubicly d) none

(2×1 = 2)

SECTION – B

Answer **any 5** questions. Weightage **1 each**.

9. Define relative error.

10. Give advantage of Regula Falsi method over bisection method.

11. Define Chebyshev's polynomial.

12. Give Lagrange's Interpolation formula.

13. What is the advantage of trapezoidal rule ?

14. What are Bessel functions ?

15. Give the advantages of Runge Kutta method.

16. Give the trapezoidal rule. **(5×1 = 5)**

SECTION – C

Answer **any 5** questions. Weightage **2 each**.

17. Find the positive root of $x^4 - x^3 - 2x^2 - 6x - 4 = 0$ by bisection method.

18. Use Gauss Jordan method to find the solution of

    $10x + y + z = 12$

    $2x + 10y + z = 13$

    $x + y + 5z = 7$

19. Explain the order of convergence of Newton's method.

20. Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using trapezoidal rule with h = 0.2.

21. Using Lagrange's formula prove

$y_1 = y_3 - 0.3\,(y_5 - y_{-3}) + 0.2\,(y_{-3} - y_{-5})$ nearly.

22. Explain Newton's forward formula.

23. Describe the cubic Splines method. **(5×2 = 10)**

SECTION – D

Answer **one** question Weightage **4**.

24. Explain Filon's method.

25. Explain the LU decomposition method. **(1×4 = 4)**