2021
BCA
[HONOURS]
(CBCS)
(B.Sc. Fifth Semester End Examination-2021)
PAPER-DSE2T

Full Marks: 40   *Time: 02 Hrs*

The figures in the right hand margin indicate marks
Candidates are required to give their answers in their own words as far as practicable
Illustrate the answers wherever necessary

Group A

1. **Answer any five questions of the following:**   **5x2= 10**

   a. What is relative error?

   b. Round off the numbers correct up to 4-decimal places.

   i)56.243827   ii)2.789654

   c. Write down the approximate representation of 2/3 correct up to 4 significant figure and then find absolute error.

   d. What is the major disadvantage of Newton-Raphson method?

   e. If $y = 4x^6 - 5x$, find the percentage error in y at $x = 1$, if the error is $x = 0.04$.

f. Show that $f(x) = x^4 + x - 1$ has a real root α in the interval [0.5, 1.0]

g. Construct the divided difference table for the data (0,1), (1,4), (3,40) and (4,85)

h. Evalute $\int_{-1}^{1} \frac{dx}{1+x^2}$ by using two point Gaussian formula.

Group B

Answer any four questions of the following:　　5x4 = 20

2. Find the value of f(1.5) in the following table

x	1	2	3	4	5
$f(x)$	4	13	34	73	136

3. Briefly explain the Bisection method for finding the root of an equation.

4. Explain the geometric representation of a Trapezoidal rule.

5. Calculate the value of $\int_{1.2}^{1.6} \left(x + \frac{1}{x} \right) dx$ correct up to two significant figures, taking 4 intervals by simpsons $\frac{1}{3}rd$ rule.

6. Find the root of $x^3 - 8x - 4 = 0$ which lies between 3 and 4 by Newton Raphson method, correct to 4 decimal places.

7. Using Gaurs-Jordan method, find the inverse of $\begin{bmatrix} 2 & 2 & 6 \\ 2 & 6 & -6 \\ 4 & -8 & 8 \end{bmatrix}$

8. Using Taylor's series method, find y at x=1.1 by solving the equation $\frac{dy}{dx} = x^2 + y^2, y(1) = 2$.

Group –C

Answer any one questions of the following:　　10x1 = 10

9. a) Compute $y(o.4)$, by Runge-kutta method.

$$\frac{dy}{dx} = xy, y(o) = 2, h = 0.2$$

b) Find $\int_{0}^{1} \frac{x \; dx}{1+x}$, taking 6 intervals by Trapezoidal rule.

10. a) Solve by Gauss-Elimination method

$$x + 2y + 3z = 10$$
$$x + 3y - 2z = 7$$
$$2x - y + z = 5$$

b) Solve by iteration method

$$8x_1 + 2x_2 - 2x_3 = 8$$
$$x_1 - 8x_2 + 3x_3 = -4$$
$$2x_1 + x_2 + 9x_3 = 12$$