Paper Code : 21311

F-411

B.C.A. (IIIrd Semester)

Examination, 2019-20

(New Course)

COMPUTER ORIENTED NUMERICAL ANALYSIS

Paper-BCA-301-N

Time : 3 Hours] [Maximum Marks : 70

***Note* :-** 1. Attempt any *five* questions. All questions carry equal marks.

2. Calculator is Allowed.

1. (a) If 0.333 is the approximate value of $\frac{1}{3}$, find absolute, relative and percentage error.

   (b) Find the product of numbers 56.64 and 12.4 which are both correct to the significant digits given.

2. (a) What are the various floating point representation of members ? Explain.

   (b) Explain bisection method for root finding also. Find real root of $e^x = 3x$ by bisection method.

3. (a) Solve by iteration method :

$$\sin x = \frac{(x+1)}{(x-1)}$$

   (b) Given that :

x	1	2	3	4	5	6
$y(x)$	0	1	8	27	64	125

   Find the value of $y(2.5)$.

   (c) What do you mean by Inter Polation ? Explain.

4. (a) Write various merits and demerits of Lagrange's formula.

   (b) Evaluate :

$$\int_0^6 \frac{dx}{1+x^2} \text{ by using}$$

   i. Simpson's one-third rule

   ii. Simpson's three-eight rule

   iii. Trapezoidal's rule

   iv. Weddle's rule

5. (a) What do you mean by Single-step Method and multi-Step Method for numerical solution of differential equations ?

   (b) Explain Picard's method of successive approximation.

6. (a) Explain Runge-Kutta Method with a suitable example.

   (b) What is Automative Error Monitoring ?

   (c) Explain Taylor's method for I order differential equation.

7. (a) Fit a straight line to the folowing data regarding x as the independent variable :

x	1	2	3	4	5	6
y	1200	900	600	200	110	50

   (b) Fit an equation of the form $y = ae^{bx}$ to the following data by the method of least squares :

x	1	2	3	4
y	1.65	2.7	4.5	7.35

8. Write any *two* short notes on the following:

   (a) Regression Analysis

   (b) Statistical Quality Control

   (c) Computer Arithmetic