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(4) **Code No. : C-291** 

Q.3 By means of Newton's divided difference formula, find the value of f(8) from the following table:

	X	4	5	7	10	11	13
Ī	f(x)	48	100	294	900	1210	2028

OR

Find the cubic polynomial which takes the following values:

X	0	1	2	3
у	1	2	1	10

Q.4 Find the value of using Simpson's three eight rule, from

following table:

X	0	1	2	3	4	5	6
У	0.146	0.161	0.176	0.190	0.204	0.217	0.230

OR

Use trapezoidal rule to evaluate considering five subinterval.

Q.5 Using Taylor's series method, solve y' = 1 - 2xy given that y(0) = 0.

# $\mathbf{OR}$

Use Runge Kutta method to solve y' = xy for x = 1.4, initially x = 1, y = 2 (take h = 0.2)

---X---

Roll No.....

Total No. of Sections : 03
Total No. of Printed Pages : 04

**Code No.: C-291** 

**Annual Examination - 2018** 

BCA - II

(BCA - 201)

# THEORETICAL FOUNDATION OF COMPUTER SCIENCE

Paper - I

## **NUMERICAL ANALYSIS**

Max.Marks: 50 Min.Marks: 20

Time: 3 Hrs.

 $\begin{bmatrix} 53 & \textbf{Not} \\ y & dx \\ -1 & 1 \end{bmatrix}$ 

Note: Section 'A', containing 10 very short-answer-type questions, is compulsory. Section 'B' consists of short answer type questions and Section 'C' consists of long answer type questions. Section 'A' has to be solved first.

# Section - 'A'

Answer the following very short-answer-type questions in one or two sentences :  $(1 \times 10=10)$ 

- Q.1 Write difference between Algebraic Equation and Transcendental Equation.
- Q.2 Write definition of zero of an equation.
- Q.3 Write statement of Intermediate value theorem.
- Q.4 Find the determinant of the matrix A =
- Q.5 Write formula of Newton Raphson method.

- (2) **Code No. : C-291**
- Q.6 Write formula of Simpson's One Third rule.
- Q.7 Write formula for Trapezoidal rule.
- Q.8 Write Taylor's series.
- Q.9 Write formula of nth approximation in Picard's method.
- Q.10 Runge Kutta method is to solve which equation?

# Section - 'B'

# Solve the following:

(3 5=15)

Q.1 Find the real root of the equation  $x^4 - x - 9 = 0$  by Newton Raphson method, correct to three decimal places.

#### OR

Find the root of the equation  $x^3 - x - 4 = 0$  using the bisection method.

Q.2 Determine rank of following matrix:

## OR

Find the eigen values and eigen vectors of the matrix:

Q.3 Evaluate:

 $\mathbf{OR}$ 

Given the values

X	x 5 7		11	13	17	
F(x)	150	392	1452	2366	5202	

Evaluate F(q) using Lagrange's formula.

- (3) Code No. : C-291
- Q.4 Find the value of  $\int_{1}^{2} \frac{dx}{x}$  by Simpson's rule.

#### OR

A river is 80 meter wide. The depth d (in meter) of the river at distance x from the bank is given by the following table :

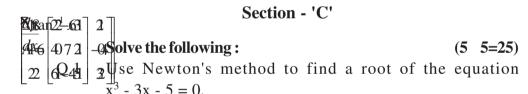
X	0	10	20	30	40	50	60	70	80
d	0	4	7	9	12	15	14	8	3

Find approximately the area of cross section of the river.

Q.5 Use Picard's method to solve = 1 + xy, with  $x_0 = 2$ ,  $y_0 = 0$ .

### OR

Solve y' = x+y, y(0) = 1 by Taylor's series method.



## OR

Find the cube root of 2 approximately by Newton Raphosn method correct to five decimal places.

Q.2 Apply Gauss - Jordan method and solve the system of equations: 10x + y + z = 12, 2x + 10y + z = 13, x + y + 5z = 7.

## OR

Using Cayley - Hamilton theorem, find the inverse of the

matrix.