Roll No.....

Total No. of Sections : 03

Total No. of Printed Pages: 05

Code No.: C-291

Annual Examination - 2019

BCA Part - II

(BCA-201)

THEORETICAL FOUNDATION OF COMPUTER SCIENCE

Paper - I

NUMERICAL ANALYSIS

Max.Marks: 50

 $x^3 - 3$ **Timel**(3**XHrs**48 = 0

Min.Marks: 20

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 Find the sum and product of the roots of the equation
- Q.2 Write definition of degree of an equation.
- Q.3 Write definition of positive definite matrix.

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- Q.4 Write definition of characteristics matrix.
- Q.5 Write definition of interpolation.
- Q.6 Write formula of Newton's backward difference inter polatron.
- Q.7 Write formula for simpson's three eight rule.
- Q.8 Write formula for Trape Zoidal Rule.
- Q.9 By using usepicard's method, find first approximation of when

given that

Q.10 Write formuls of approximate in Euler's method.

Section - 'B'

Answer the following short-answer-type questions with word limit 150-200: (3 5=15)

Q.1 Using bisection method, find real root of

OR

Find the equation whose roots are

Q.2 Solve the following system by Gauss elimination method.

$$6x_1 + 3x_2 + 2x_3 = 6$$

and

OR

Determine the eigen values of the matrix.

Q.4 Given that $y = \log x$ and

x 4.0 4.2 4.4 4.6 4.8 5.0 5.2 y 1.3863 1.4351 1.4816 1.5261 1.5636 1.6094 1.6487

Evalute

- (a) Simpson's $\frac{3}{8}$ Rule
- (b) Waddle's Rule.

OR

To show that

The standard of the approximate y when x = 0.1, x = 0.2 disc. $\frac{1}{3}$ $\frac{1}{3}$

k = 0 given that

OR

Use Runge-Kutta method to approximate the value of y when

given that and .

---X---

Q.3 Given $Sin 50^{\circ} = 0.7660$, $Sin 55^{\circ} = 0.8192$,

 $Sin 60^{\circ} = 0.3660$, find out $Sin 52^{\circ}$, by using any method of interpolation.

OR

Using Lagrange's interpolation formula, find out the value of y for from the following table.

: 7 8 9 10 : 3 1 1 9

Q.4 Evalute by Trapezoidal rule.

OR

Evaluate $\int_0^1 \frac{dx}{1+x}$ using simpson's .

Q.5 Given with the initial condition that when . Compute correct to four decimal by using Taylor's series method.

OR

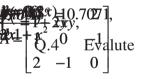
Apply Euler's method, solve for Y at x = 0.6 from y(0) = 0 taking .

Q.3 Given $Sin 50^\circ = 0.7660$, $Sin 55^\circ = 0.8192$, $Sin 60^\circ = 0.3660$, find out $Sin 52^\circ$, by using any method of interpolation.

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Apply Euler's method, solve for Y at x = 0.6 from y(0) = 0 taking .

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Section - 'C'

Answer the following long-answer-type questions with word limit 300-350: (5 5=25)

Q.1 Find the real root of the equation using Regula-Fulsi method.

OR

Evaluate to to four places of decimal by using Newton Raphson method.

Q.2 Using Cayley Hamilton theorem, find the inverse of the matrix.

OR

Apply Gauss-Jordan method and solve the system of equations

Q.3 By Newton's backward interpolation formula, the population of a country in decenial censuses were as under. Estimate the population for year 1925.

year x : 1891 1901 1911 1921 1931 Population y : 46 66 81 93 101 (in thousands)

OR

By means of Newton's divided difference formula, find the value of from the following table.

x : 4 5 7 10 11 13 : 48 100 294 900 1210 2028

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Section - 'C'

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Q.1 Find the real root of the equation using Regula-Fulsi method.

OR

Evaluate to to four places of decimal by using Newton Raphson method.

Q.2 Using Cayley Hamilton theorem, find the inverse of the matrix.

 $A = \begin{bmatrix} 2 & -3 & 0 \\ 2 & -3 & 0 \end{bmatrix}$ 2x + 10y + z = 13, x + y + 5z = 7.

1 1 Apply Gauss-Jordan method and solve the system of equations

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