Code No. : C-291

Annual Examination - 2019

BCA Part - II

(BCA-201)

THEORETICAL FOUNDATION

OF COMPUTER SCIENCE

Paper - I

NUMERICAL ANALYSIS

Max.Marks : 50

$x^3 - 3x^2 - 16x + 48 = 0$ **Time : 3 Hrs.**   **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 × 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.

P.T.O.

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 $\dfrac{3}{8}$ Rule

(b)   Waddle's Rule.

OR

To show that

Use Picard's method, the approximate y when $x = 0.1$, $x = 0.2$

$k = 0$ given that   .

OR

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

given that   and   .

---X---

Q.3   Given $Sin\,50^o = 0.7660,\ Sin\,55^o = 0.8192,$
$Sin\,60^o = 0.3660,$ find out $Sin\,52^o$, 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 $\int_0^1 \dfrac{dx}{1+x}$ 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

$$y(0) = 0 \text{ taking} \qquad .$$

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 : (in thousands)		46	66	81	93	101

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