

S.D.E.

B.C.A. (2004 Course Sem- II : SUMMER - 2019

SUBJECT : NUMERICAL METHODS

Day : Wednesday

Date : 08/05/2019

S-2019-4964

Time : 10.00 AM TO 1.00 PM

Max. Marks : 80

N.B.

- 1) Attempt **ANY FIVE** questions from Section – I and **ANY TWO** questions from Section – II.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Answer to both the sections should be written in **SAME** answer books.
- 4) Use of simple calculators and logarithmic table is **ALLOWED**.

SECTION – I

- Q.1** Solve the following system of linear equations using Gauss Elimination method. (10)

$$\begin{aligned}x + 2y + z &= 0 \\2x + 2y + 3z &= 3 \\-x - 3y &= 2\end{aligned}$$

- Q.2** Find the interpolating polynomial which takes the following values : (10)

x	0	1	2	3	4	5
y	41	43	47	53	61	71

- Q.3** Fit the curve $y = a + bx + cx^2$ which fits the following data : (10)

x	0	1	2	3	4
y	1	1.8	1.3	2.5	2.3

Estimate y when x = 1.5

- Q.4** Solve the following system of equations using Gauss-seidal method upto 3 iterations. (10)

$$\begin{aligned}5x + 2y + z &= 12 \\x + 4y + 2z &= 15 \\x + 2y + 5z &= 20\end{aligned}$$

- Q.5** Convert the following : (10)

- a) $(11010001101)_2 = ?_{16}$
- b) $(15A)_{16} = ?_2$

- Q.6** Use Newton Raphson method to obtain a root for $f(x) = x^3 - 5x + 3$ upto three decimal places. (10)

- Q.7** Write short notes on **ANY TWO** of the following : (10)

- a) Extrapolation
- b) Bisection Method
- c) Accuracy and Precision

SECTION – II

Q.8 Apply inverse interpolation formula to find value of x for y = 2. (15)

x	30	34	38	42
y	-30	-13	03	18

Q.9 Solve the differential equation using Runge Kutta 4th order Method to find the value of y when x = 1. (15)

Given that y = 1 when x = 0 and $\frac{dy}{dx} = \frac{y-x}{y+x}$

Q.10 Compute $\int_0^{20} f(x) dx$ by Simpson's 1/3rd rule, where (15)

x	0	5	10	15	20
f(x)	1.0	1.6	3.8	8.2	15.4

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