S.D.E.

B.C.A. (2004 Course Sem- II : WINTER - 2018

SUBJECT : NUMERICAL METHODS

Day : Tuesday
Date : 04/12/2018

W-2018-4511

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 **SEPARATE** 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)**

$$3x - y + z = 6$$
$$4x - y + 2z = 7$$
$$2x - y + z = 4$$

Q.2 Determine the interpolating polynomial of degree three for the table below: **(10)**

x	–1	0	1	2
f(x)	1	1	1	–3

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 = 2.5

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

$$20x_1 + 20x_2 + x_3 = 30$$
$$x_1 - 40x_2 + 3x_3 = -75$$
$$2x_1 - x_2 + 10x_3 = 30$$

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

a) $(6752)_8 = ?_2$
b) $(1101110011)_2 = ?_{16}$

Q.6 Find the roots of equation $f(x) = x^2 - 3x + 2$ using Newton Raphson Method. **(10)**

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

a) Errors in computing
b) Interpolation Techniques
c) Accuracy and Precision

SECTION – II

Q.8 Using Inverse Interpolation, find the value of x for y = 5 . **(15)**

x	1	3	4
y	3	12	19

Q.9 Solve the differential equation using Runge Kutta 4th order Method. **(15)**

Given $\frac{dy}{dx} = x + y,\ y(0) = 1$

Compute value of y (0.1) and y (0.2).

Q.10 Find the real root of the equation $x^3 - 2x - 5 = 0$ using Secant Method. **(15)**

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