NEW

2016

BCA

3rd Semester Examination

COMPUTER ORIENTED NUMERICAL METHOD AND STATISTICAL METHOD

PAPER—2103

Full Marks : 70

Time : 3 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Answer *Question no. 1* and any *four* from the rest.

1. Answer any *five* questions : 5×2

(a) Write approximate representation of $\pi = \frac{22}{7}$.

Correct upto three significant digits. Find the absolute, relative and percentage error.

(b) What is interpolating polynomial ?

(c) Write the advantage of Regula-False Method.

(d) Prove that $(1+\Delta)(1-\nabla) \equiv 1$.

(e) What is the condition of applying Simpson's $\frac{1}{3}$ rule ?

(f) What is probability distribution function ?

(g) What is statistical regularity ?

(h) A die is thrown. What is the probability of occurance of even face ?

2. (a) Write the condition of convergence of iteration process. 6

(b) Find a real root of $f(x) = x^3 - 4x - 9 = 0$ by bisection method. 9

3. (a) Compute f(0.23) and f(0.29) using the table

x	0.20	0.22	0.24	0.26	0.28
f(x)	1.6596	1.6698	1.6804	1.6912	1.7024

9

(b) Compute $\int_2^{10} \frac{dx}{1+x}$ using simpson's $\frac{1}{3}$ rule taking $h = 1.0$ and compare the results with the exact value. 6

4. (a) Establish the relation between Forward and Backward differences.

(b) Solve by Gauss-Seidal method.

$$8x_1 + 2x_2 - 2x_3 = 8$$

$$x_1 - 8x_2 + 3x_3 = -4$$

$$2x_1 + x_2 + 9x_3 = 12$$ 6+9

5. (a) Establish the sufficient condition of convergence of the Newton-Raphson method.

(b) Evaluate y(0.02) using Euler's Method for the problem

$\frac{dy}{dx} = x^2 + y$ with $y(0) = 1$. 7+8

6. (a) Write the density and distribution function of the standard normal distribution.

(b) Find the root of the equation $x^3 - 8x - 4 = 0$ by Newton-Raphson method. 7+8

7. (a) Establish Trapezoidal formula from Newton's forward difference formula.

(b) Write advantage and disadvantage of Lagrangian Interpolation formula. 9+6
