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Total No. of Pages : 02

Total No. of Questions : 07

B.Sc.(IT) (2013 & 2014) (Sem.-4)
COMPUTER ORIENTED NUMERICAL METHODS
Subject Code : BS-208
Paper ID : [B0416]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **SIX** questions carrying **TEN** marks each and a student has to attempt any **FOUR** questions.

SECTION-A**1. Answer briefly :**

- a) Define different types of errors in number.
- b) Suppose 1.414 is used as an approximation of $\sqrt{2}$. Find absolute error.
- c) What is the order of convergent of bisection method?
- d) Write two different types of Iterative method.
- e) Write two different type of regression lines.
- f) Evaluate integral $\int_0^1 \frac{dx}{1+x^2}$ using Trapezoidal rule with $h = 0.2$.
- g) Find the absolute error if the number $x = 0.004997$ is truncated to three decimal types.
- h) Write the formula for Runge-Kutta method of third order.
- i) Evaluate integral $\int_0^6 \frac{dx}{1+x^2}$ using $h = 1$, by Simpson's 1/3 rule.
- j) Write Taylor series for approximation of functions.

SECTION-B

2. Find a root of equation $x^3 - 4x - 9 = 0$ using bisection method.
3. Solve by Guass – seidel method :

$$27x + 6y - z = 85$$

$$x + y + 54z = 110$$

$$6x + 15y + 2z = 72$$

4. Given the values :

$x :$	5	7	11	13	17
$f(x) :$	150	392	1452	2366	5202

Evaluate $f(9)$ using lagrange interpolation formula

5. Solve by Taylor series method upto third order and equation

$$\frac{dy}{dx} = \frac{x^3 + xy^2}{e^x} \text{ for } y(0) = 1 \text{ for } y \text{ at } x = 0.1, x = 0.2 \text{ and } x = 0.3$$

6. Apply predictor – corrector method to solve $\frac{dy}{dx} = x - y^2$ in the range $0 \leq x \leq 1$ for boundary condition $y = 0$ at $x = 0$.
7. If $u = \frac{4x^2 y^3}{z^4}$ and errors in x, y, z be 0.001. Compute relative maximum error in U and $x = y = z = 1$.