

Roll No. 

Total No. of Pages : 02

Total No. of Questions : 07

B.Sc. (IT) (Sem.-4<sup>th</sup>)**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 students has to attempt any FOUR questions.

**SECTION-A**

1. Write briefly :

- (a) What are truncation errors in interpolation method ?
- (b) Define Simpson's  $\frac{1}{3}$ rd rule.
- (c) Why Gauss Jordan method requires double the elementary row operations than Gauss Elimination method ?
- (d) What method do you think is the best for getting solution of equations in the category of iterative methods ?
- (e) What do you mean by 'Linear Regression' ?
- (f) Write some pit falls in computing.
- (g) Give formula of Trapezoidal Rule.
- (h) Give formula of Newton-Raphson method.
- (i) What is Binary Representation of Numbers ?
- (j) Give comparison of Runge-Kutta and Predictor Corrector method.

### SECTION-B

2. Evaluate  $\sqrt{28}$  to four decimal places by Newton's iterative method.
3. From the following table, estimate the number of students who obtained marks between 40 and 45.

Marks	30-40	40-50	50-60	60-70	70-80
No. of students	31	42	51	35	31

4. Evaluate :  $\int_0^6 \frac{dx}{1+x^2}$  by using

(i) Trapezoidal rule,

(ii) Simpson's  $\frac{1}{3}$ rd rule,

(iii) Simpson's  $\frac{3}{8}$ th rule.

5. Given that

x	1.0	1.1	1.2	1.3	1.4	1.5	1.6
y	7.989	8.403	8.781	9.129	9.451	9.750	10.031

find  $\frac{dy}{dx}$  and  $\frac{d^2y}{dx^2}$  at  $x = 1.1$ ,  $x = 1.6$

6. Apply Runge-Kutta fourth order method & find an approximate value of  $y$  when  $x = 0.2$ . Given by  $\frac{dy}{dx} = x + y$  and  $y = 1$  when  $x = 0$ .
7. Write down the working rule of Predictor-Corrector Method.