

Roll No.

41276

41276

**B. Sc. (Hons.) Physics 4th Semester
Examination – May, 2019**

**COMPUTER FUNDAMENTALS AND
PROGRAMMING - II**

Paper : Phys 306

Time : Three hours]

[Maximum Marks : 40

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in all, selecting at least two questions from each Unit.

UNIT – I

1. (a) Differentiate between round off and truncation error. Give examples. 4
- (b) Explain why Newton-Raphson method is also called method of tangent ? 4
2. (a) Solve the following equations using gauss elimination method : 4

P. T. O.

$$x_1 + 2x_2 + x_3 = 1$$

$$2x_1 - x_2 + 2x_3 = -3$$

$$x_2 + 3x_3 = 1$$

- (b) Find a solution of $f(x) = x^3 - x - 1 = 0$ by iteration. 4
3. (a) Find the positive solution of $f(x) = x - 2 \sin(x) = 0$ by the secant method, starting from $x_0 = 2, x_1 = 1.9$. 4
- (b) Discuss the comparison and error estimation between bisection and Newton-Raphson method. 4
4. (a) Solve the following equations using Gauss Seidel method (perform only three iterations with initial Guess as $x_0 = 0, y_0 = 0, z_0 = 0$) 4
$$27x + 6y - z = 54$$
$$26x + 15y + 2z = 72$$
$$x + y - 54z = 110$$
- (b) Under what conditions the Gauss Seidel method converge. 4

UNIT – II

5. (a) Deduce the final expression of trapezoidal rule for numerical integration. 4
- (b) Given $\frac{dy}{dx} = -y$ with $y(0) = 1$. Using step size $h = 0.01$. Find $y(0.01)$ and $y(0.02)$ by Euler method. 4

(2)