Roll No. ....

41276

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

COMPUTER FUNDAMENTALS AND PROGRAMMING - II

Paper : Phy-406

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

6. (a) Apply the Runge-Kuttta method of second or to solve $\frac{dy}{dx} = x + y$ with $y(0) = 0$ by using size h = 0.2 to compute five values of y.

(b) Give geometrical interpretation of Runge-Ku forth order method.

7. (a) Using Newton backward difference formu compute $f(4.5)$ from the following set of data :

x	f(x)
1	14
2	27
3	40
4	55
5	68

(b) Describe the brief about the Gauss quadrature formulas. 4

8. (a) Evaluate $I = \int_0^1 e^{-x^2} dx$ using the Simson's 1/3 rule with 2m =6 and estimate the error. 4

(b) Evaluate $I = \int_0^1 e^{-x^2} dx$ using the Trapezoidal rule with n = 6 and estimate the error. 4
