SEMESTER-3(HONOURS)- PHYSICS PRACTICAL EXAMINATION

PAPER-CC-5

TIME:2 Hrs **FULL MARKS:30**

Answer any **five** of the following questions.

1.Consider the following matrix

A=$\begin{pmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \\ 1 & 4 & 9 \end{pmatrix}$ Write a python code to calculate eigen values and eigen vectors of the given matrix. 6

2) Write a program to find out the solutions of the following simultaneous equations using Gauss-elimination method

$$x_1 + x_2 + 2x_2 = 4$$

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

$$2x_1 - 3x_2 - 5x_3 = -5$$

6

3)Write a programme to calculate the following definite integral using Simpson's 1/3 method

$\int_0^5 (0.5x + 3)dx$ 6

4).In some experimental measurement data are recorded in terms of pair of values (x,y).For a value of x (measured in some arbitrary unit ; does not matter in this case) we have a value of y (the unit does not matter) . Find the value at some intermediate point: x=18 (Use a suitable python code)

x	5	10	15	20	25	30
y	45	105	174	259	364	496

6

5) Explain in detail the linspace and arange functions in numpy in python 3+3

6)Explain the arguments 'subplot' function in matplotlib .

Write a python code two plot the following four functions using 'subplot'

a) $f_1(x) = x^{0.5} \exp(-x)$

b) $f_2(x) = x^{0.25}\, exp(-x^2)$

c) $f_3(x) = x^2 \exp(-x)$

d) $f_4(x) = x^4 \exp(-x^2)$

for a range of x 0 to 4 6