

PRABHAT KUMAR COLLEGE, CONTAI

M. Sc. 1st Semester Examination-2021

Subject: Physics Paper: **PHS 196** Full Marks: 50 Time: 2 hr

Computer Practical

Answer any TWO question

2×25=50

1. (a) Write a computer program to evaluate

$$\int_0^1 \frac{dx}{1+x^2}, \quad \text{Use Simpson's 1/3 rule.}$$

- (b) Write a computer program to find factorial value of any positive integer number. (15+10)

2. (a) Write a computer program following Newton-Raphson method to find a real root of the equation $\cos(x) = x$, around $x \approx 1$. The root must be correct up to 5 decimal places.

- (b) Write a computer program to check whether a number is prime or not. (15+10)

3. (a) Write a computer program following trapezoidal rule to evaluate

$$\int_1^5 \frac{dx}{3x-1}$$

- (b) Write a computer program to find mean, r.m.s and variance of the following numbers: 9, 11, 25, 29, 47, 33, 78, 53, 19, 40.

(15+10)

4. (a) Write a computer program following bisection method to find a root of the equation $\cos(x) - \sqrt{x} = 0$ in the interval $[0, 1]$. The root must be correct up to 5 decimal places.

- (b) Write a computer program for multiplication of two matrices. (15+10)

5. (a) Using Simpson's 1/3 rule, compute the following integral:

$$\int_0^{\pi/2} \frac{\sin(x)}{1 + (\cos(x))^2} dx$$

- (b) Write a program to compute sum of even numbers up to 100.

- (c) Write a program to compute $1 + 1/3 + 1/5 + \dots + 1/99$. (15+5+5)

6. (a) Write a computer program for sorting data in ascending order.

- (b) Write a computer program to find the trace of the following matrix:

$$\begin{pmatrix} 3 & 5 & 7 \\ 9 & 6 & 2 \\ 8 & 4 & 5 \end{pmatrix}$$

(15+10)