U.G. 1st Semester Examination - 2020

PHYSICS

[HONOURS]

Course Code : PHYS-H-CC-P-01

(Mathematical Physics-I)

[PRACTICAL]

Full Marks : 20 Time : 2 Hours

The figures in the right-hand margin indicate marks.

Answer any **four** questions: 5×4=20

You can use any of the Languages like Python / Fortran / Matlab / C / C++ to write programs, where they appears in the following questions)

1. Write a program to do the following:

   One has the option to put some integer through keyboard, and the program finds whether it is prime or not.

2. Write an algorithm for finding the largest of a given list of numbers and its location in the list.

3. Write a program to find root of the equation $x^2 \exp(x) = 10$ using bisection method.

4. Write an algorithm to find the positive root of the equation $x^3 + 3x^2 - 4x = 5$ using Newton-Raphson method.

5. Write a program to find the solution of the equation $\frac{\sin(x)}{x} = \frac{\pi}{6}$ between 1 and 3 using secant method.

6. Write down Newton's forward difference interpolation formula for n-th order polynomial. Using this formula and the following table calculate f(12).

x	5	10	15	20	25
f(x)	29	48	61	75	88

7. Write a short note on numerical differentiation using Newton's forward difference formula.

8. Write down the algorithm for Simpson's 1/3 rule for numerical integration.

9. Write down the algorithm for solving ordinary differential equation using Runge-Kutta second order method.

———————