

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2024
(Regular/ Improvement / Supplementary)
PHYSICS

GPHY5B06T: COMPUTATIONAL PHYSICS

Time: 2 Hours

Maximum Marks: 60

SECTION A: Answer the following questions. Each carries *two* marks.
(Ceiling 20 marks)

1. Distinguish between Compilers and interpreters.
2. Write the python instruction for reading data from the keyboard. Give one example.
3. Give the rule for naming python variable.
4. Write the output of the following code:


```
a= [1,3,5]
b= [2,5,6]
c= a + b
print (c)
```
5. Explain the string operators: + and *
6. What are Dictionaries in Python? How will you call an item in a python dictionary?
7. Write any two ways of importing a module. Give suitable example.
8. Distinguish between range () and arrange ().
9. Write the instruction for labeling the axes of a plot in the 'matplotlib.pyplot' module.
10. Compare analytic method and numerical method.
11. What do you mean by interpolation? Name any two interpolation techniques.
12. What will you infer about a function if all the third forward differences of the function become zero?

SECTION B: Answer the following questions. Each carries *five* marks.
(Ceiling 30 marks)

13. Write a python program to print first 12 rows of the multiplication table of a number.
14. Explain various list methods with suitable example.
15. Explain how user defined functions are created in python.
16. Evaluate the first derivative of y at x = 0 from its tabulated values given below.

x	0	1	2	3	4
y	1	2	5	10	17

17. Find the root of the equation $\sin(x) = 0.8$ between 0 and 1.57 using bisection method.
18. Write a python program to simulate free fall using Euler's method.
19. Write the second order differential equations which represent the motion of a body dropped into a highly viscous medium. Explain the steps involved in the simulation of its trajectory.

SECTION C: Answer any *one* question Each carries *ten* marks.

20. What do you mean by curve fitting? Derive the formula for fitting a straight line using the principle of least squares.
21. Write the second order differential equations which represent the motion of a Projectile. Simulate the trajectory of a projectile by solving the above equation.

(1 × 10 = 10 Marks)