

24P209

(Pages: 2)

Name:

Reg.No:

SECOND SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2025

(CBCSS - PG)

(Regular/Supplementary/Improvement)

CC19P PHY2 C08 - COMPUTATIONAL PHYSICS

(Physics)

(2019 Admission onwards)

Time : 3 Hours

Maximum : 30 Weightage

Section A

Answer *all* questions. Each question carries 1 weightage.

1. Differentiate between compiler and interpreter.
2. WAP to input the side of a cube and to find its volume and surface area.
3. Write a short note on formatted printing.
4. Outline various functions used for the creation of arrays.
5. Write a short note on linear algebra module in python.
6. What do you mean by curve fitting?
7. What do you mean by initial value problems? Give an example.
8. How can you incorporate the effect of viscous force in a body falling through a fluid?

(8 × 1 = 8 Weightage)

Section B

Answer any *two* questions. Each question carries 5 weightage.

9. Explain the various iterative constructs in python with examples and codes of python.
10. Explain the matplotlib module with its various preparatory and plotting functions.
11. Explain the finite equilibrium method and shooting method used to solve boundary value problems.
12. Explain the motion of an Ideal Simple Harmonic Oscillator using Euler method.

(2 × 5 = 10 Weightage)

Section C

Answer any *four* questions. Each question carries 3 weightage.

13. Explain the various operations on lists and sets in python?
14. Following table gives the census population(in million)of a state for the years 1971 to 2011. Estimate the population for the year 1974 by appropriate interpolation technique.

Year	1971	1981	1991	2001	2011
Population	46	66	81	93	101

15. Evaluate using Simpson's rule with step size=0.25

$$\int_0^1 \frac{dx}{1+x^2}$$

16. Find the solution of the equation $f(x)=x^3-2x-5$ using bisection method.

17. Solve the differential equation $\frac{dy}{dx} = \frac{2y}{x}$ at $y(1.5)$, given that $y(1) = 2$, by 4th order R-K method.
Choose step size = 0.25.

18. Write a program to compute the DFT of a sequence.

19. Explain the theory of projectile motion with air drag.

(4 × 3 = 12 Weightage)
