

25P209

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Name:

Reg.No:

SECOND SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2026

(CBCSS - PG)

(Regular/Supplementary/Improvement)

CC19PPHY2C08 - COMPUTATIONAL PHYSICS

(Physics)

(2019 Admission onwards)

Time : 3 Hours

Maximum : 30 Weightage

Section A

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

1. What are the advantages of python over other programming languages?
2. WAP to input the temperature in Celsius scale and then convert it into Fahrenheit scale.
3. Write a short note on formatted printing.
4. Explain different array modification techniques with suitable examples.
5. Explain solving simultaneous equations using Matrix method.
6. Write down the algorithm for regula-falsi method.
7. How do you solve a boundary value problem using shooting method?
8. A body is falling under gravity. Estimate the velocity and position after 6 second, considering the variations in the gravitational field. Do the calculations at an interval of 1 second. ?

(8 × 1 = 8 Weightage)

Section B

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

9. Explain different data types in python with examples.
10. Explain the matplotlib module with its various preparatory and plotting functions.
11. a) Write in detail about the 2nd order R-K method used to solve ordinary differential equations.
b) Develop a python program to solve the D.E $dy/dx = 2y/x$ is with an initial value $y(1)=2$. Estimate $y(1.25)$ with a step size 0.25.
12. Explain how you can simulate the planetary motion using 4th order RK method.

(2 × 5 = 10 Weightage)

Section C

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

13. Write a programme to check if the given number is a palindrome or not.
14. Use the trapezoidal rule to numerically integrate $f(x) = 0.2 + 25x + 3x^2$ from $a=0$ to $b=2$ with a step size of 0.25.
15. How can you fit an exponential curve using least squares method?
16. Find the value of $f'(0.5)$ using Newton's forward difference method from the given data.

x	0	1	2	3
f(x)	5	6	3	14

17. Solve $y'' + y^3 - 0.5 = 0$ for $y=1$ with a step size of 0.2. Given, $y(0)=1$ and $y'(0)=1$ using Euler method.
18. Explain the Numerov's method for solving boundary value problems.
19. WAP in python solve any one dimensional Schrodinger equation numerically.

(4 × 3 = 12 Weightage)
