23U508 (Pages: 2) Name: .....

Reg.No: .....

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19UPHY5B06 / CC20UPHY5B06 - COMPUTATIONAL PHYSICS

(Physics - Core Course)

(2019 Admission onwards)

Time : 2.00 Hours Maximum : 60 Marks

Credit : 3

Part A (Short answer questions)

Answer ***all*** questions. Each question carries 2 marks.

1. What is an assembler in computer programming?
2. How to print multiple things in same line seperated by tab using print command?
3. What is a python set? How to create them?
4. What is the importance of pickling in python?
5. Write a short note on NumPy?
6. Write a note on polar plots?
7. What is meant by finite differential method?
8. Explain the two methods used for numerical integration.
9. Briefly explain about Euler method.
10. What is meant by computational approach in physics?
11. Explain the errors formed in the problem of freely falling body by Euler's method. How is it rectified?
12. Explain the need of optimization of step size in a numerical problem.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer ***all*** questions. Each question carries 5 marks.

13. Explain different modes of operation of python with advantages in each.
14. What are operators in python? Explain with examples.
15. Differentiate between python tuples and dictionaries. What are they used for?
16. How to define functions in python? Define a function to find square of a number received as input from user.

17. Find the equation of best fit straight line for the given data.

X	1	2	4	5	6	7	8
Y	-3.5	-1.4	0.8	5.2	7.4	9.6	11.8

18. A rocket is launched from the ground. The variation of velocity is as tabulated below. Find the acceleration at 20 seconds.

X	0	10	20	30	40	50	60	70
V	30.00	31.63	33.44	35.47	37.75	40.33	43.29	46.69

19. Evaluate $\int_{-1}^{1} e^x \, dx$ using Simpson's rule.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any ***one*** question. The question carries 10 marks.

20. Explain different control and looping statements in python.

21. Contrast between numerical method and analytical method. Use the example of curve fitting to explain how datas obtained in a scientific experiment is handled using numerical method.

(1 × 10 = 10 Marks)

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