

21U508

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Name:

Reg.No:

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2023

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19U PHY5 B06 / CC20U PHY5 B06 - 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 algorithm in a computer program?
2. What are the advantages and unique features of python language?
3. How to print multiple things in same line without separation using print command ?
4. What is a string in python ?
5. How to add a new item into a python set ?
6. What is a tuple in python ? How to create them ?
7. What is meant by a python module?
8. Write a short note on NumPy.
9. State the advantages of numerical methods.
10. Explain the curve fitting method.
11. Explain the forward differential operator. Give any method which uses this operator.
12. Differentiate between round - off error and truncation error.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. Explain five different list operations in python with examples.
14. What is the use of 'for' statement in python programming? Explain with example.
15. Find the first derivative at $x = -2$ using the table given below.

X	-3	-2	-1	0	1	2	3
Y	-30	-15	-5	0	5	15	30

16. Find $\sqrt[3]{15}$
17. Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using Trapezoidal rule.
18. Find $\sin(40)$ using numerical method.
19. 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.

(Ceiling: 30 Marks)

Part C (Essay questions)

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

20. Explain different plotting functions in matplotlib module.
21. Explain with examples the reasons why numerical techniques are needed for solving problems in physics.

(1 × 10 = 10 Marks)
