

19U507

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Name: .....

Reg.No: .....

**FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2021**

(CBCSS - UG)

**CC19U PHY5 B06 - COMPUTATIONAL PHYSICS**

(Physics - Core Course)

(2019 Admission - Regular)

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 the meaning of syntax rule in computer programming?
2. Name different data types in python.
3. What is meant by a variable in python?
4. How to find number of elements in a python list?
5. Differentiate between python list and set.
6. Differentiate between python list and tuple.
7. What is the use of 'if...else' statement in python programming?
8. Give any four operations using NumPy.
9. Give the definitions of interpolation and extrapolation.
10. Mention the different applications of Newton's interpolation formula.
11. Differentiate between Trapezoidal rule and Simpsons' 1/3 rule for integration.
12. What is the need of numerical analysis in computer programming?

**(Ceiling: 20 Marks)**

**Part B** (Short essay questions - Paragraph)

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

13. What are the advantages and unique features of python language over other programming languages?
14. How to input from a file and output to a file in a program? Explain with example.
15. Give a short note on how the technique of numerical method is used to solve a mathematical problem. Mentions its advantages.
16. In an experiment, the following data table have been constructed. Obtain a straight line that fits the data.

X	8.3	12.3	18.8	22.4	23.1	24
Y	0.32	0.46	1.10	1.32	1.26	1.44

17. Find  $\sqrt{8}$  using bisection method.
18. Find  $\sin(40)$  using numerical method.
19. How can you incorporate the effect of viscous force in a body falling through a fluid ?

**(Ceiling: 30 Marks)**

**Part C** (Essay questions)

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

20. Explain syntax for plotting graphs, multiple plots, polar plots and labelling, scaling axis, colouring them using matplotlib.
21. Explain the method to simulate radioactive decay of a nucleus by Euler method.

**(1 × 10 = 10 Marks)**

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