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Name: ....

Reg.No: ....

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2022
(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 the meaning of syntax rule in computer programming?

2. Differentiate between interactive and script mode in python.

3. Write the general syntax of print command.

4. How to find largest number in a python list?

5. Differentiate between python list and set.

6. What is meant by a python module?

7. What is meant by pickling in python?

8. Write a short note on NumPy.

9. What is meant by solving a scientific problem using numerical methods?

10. What is meant by finite differential method?

11. What are the advantages of Simpsons' 1/3 rule over trapezoidal method?

12. Explain the significance of computational methods in solving problems in physics.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. Differentiate between python tuples and dictionaries. What are they used for?

14. What is the use of 'for' statement in python programming? Explain with example.

15. 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

16. 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

17. Find the root of the expression $x^2 - 4x + 4$ using Newton-Raphson method.

18. Write a python code for solving the differential equation $\frac{dy}{dx} = \frac{2y}{x}$ with initial value y(1)=2 using first order R-K method.

19. A body is projected with velocity of 10m/s at an angle 45 degree. Tabulate the position and velocity for the first 1 second with an interval of 0.25 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. With help of python code explain the problem of freely falling body under gravity.

(1 × 10 = 10 Marks)

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