SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2022
(CUCBCSS-UG)
CC15U PH6 E01 - COMPUTATIONAL PHYSICS
(Physics – Elective)
(2016 to 2018 Admissions – Supplementary/Improvement)

Time: Three Hours   Maximum: 80 Marks

Section A
Answer *all* questions. Each question carries 1 mark.

1. Human readable form of a program is known as _____.

2. In python, the result of 22%5 is _____.

3. The index of second element in a list is _____.

4. Trapezoidal method is used for _____.

5. What will be the output of the expression 5+3/2+6/6 in Python?

Write True or False:

6. A list may contain elements of different types.

7. Python is an example of low level language.

8. Numerical method is preferred over analytical method because it is more accurate.

9. Least square approximation is a method of curve fitting.

10. Accuracy of numerical integration can be increased by increasing interval size.

(10 × 1 = 10 Marks)

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

11. What are the different arithmetic operators in Python? Give its precedence.

12. What is the meant by discretisation of a continuous variable?

13. Distinguish between compiler and interpreter.

14. What is meant by curve fitting?

15. How sets are created in python?

16. What are the advantages of numerical method over analytical method?

17. Explain the difference between 'read' and 'readline'.

(7 × 2 = 14 Marks)

Section C
Answer any *five* questions. Each question carries 4 marks.

18. Compare between lists and dictionaries in Python.

19. What is meant by pickling in python?

20. What are modules? Explain the different ways of using it in Python program with suitable examples.

21. Explain Runge-Kutta method for the solution of first order differential equations.

22. Discuss the different types of errors possible when solving physical problems using computers.

23. Explain the concept of difference table with an example.

24. Explain break and continue functions in a loop.

(5 × 4 = 20 Marks)

Section D
Answer any *four* questions. Each question carries 4 marks.

25. Discuss a Python program to check whether the given word is a palindrome.

26. Write a program for solving the quadratic equation with 'nested if'.

27. Explain how the motion of a particle moving under the influence of a central force can be numerically analysed.

28. Develop a python code for the Taylor series expansion of sin x and cos x.

29. Develop a Python program for checking whether the given number is a prime or not.

30. Discuss a method to study the motion of a stone which is dropped from a height H.

31. Using Newton- Raphson method, find the root of $x^2 - 5x + 6$.

(4 × 4 = 16 Marks)

Section E
Answer any *two* questions. Each question carries 10 marks.

32. With suitable examples, explain different flow controls in Python.

33. a) Explain different Data types in Python.

    b) Explain different types of list methods in python.

34. Discuss with suitable theory, how motion of a projectile can be simulated and analysed using Python. Consider the different factors affecting the motion.

35. Write a python code to find the terminal velocity of a freely falling body considering the air drag and explain the required theory.

(2 × 10 = 20 Marks)

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