

19. (a) What is inverse function? How to find the inverse of a function? .

Or

- (b) Write a few sentences about the shooting and relaxation methods?
20. (a) What is Euler method? Explain with some examples.

Or

- (b) Write a short notes on simulation of radioactivity?

SECTION C — (3 × 10 = 30)

Answer any THREE questions.

21. Write a program to check whether entered string is palindrome or not.
22. What are the differences between Numpy array and matrices?
23. Write a short notes on the following :
- (a) Legendre functions
- (b) Bessel functions.
24. Elucidate the Monte Carlo methods in detail.
25. Briefly elaborate the driven LCR circuit.

S.No. 3249

P 22 PYE 1 B

(For candidates admitted from 2022-2023 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Physics – Elective

PHYSICS SIMULATION WITH PYTHON

Time : Three hours

Maximum : 75 marks .

SECTION A — (20 marks)

- I. (A) Multiple choice questions : (5 × 1 = 5)
1. What arithmetic operators cannot be used with strings in python?
- (a) * (b) -
- (c) + (d) All of the mentioned
2. To declare an array, you must use
- (a) Brackets [] (b) Curly braces { }
- (c) Parenthesis () (d) Pipes | |
3. With respect to multimedia, sampling rate is the number of times the analog sound is taken per
- (a) Month (b) Second
- (c) Hour (d) Minute

4. What is the time period of a pendulum hanged in a satellite? (T is the time period on earth)
- (a) Zero (b) T
(c) Infintie (d) $T/2\pi$

5. _____ law is based on the principle of conservation of electric charge.

- (a) Kirchhoff's Current law
(b) Kirchhoff's Voltage law
(c) Ohm's law
(d) Lenz lAw

(B) Fill in the blanks : ($5 \times 1 = 5$)

6. _____ is used to create an empty set in python.

7. Numpy in the python provides the _____

8. Matplotlib is _____ plotting library.

9. Data _____ refers to graphical representation of data.

10. Numerical techniques more commonly involve _____

II. Answer the following questions : ($5 \times 2 = 10$)

11. What is a variable?

12. What is Numpy?

13. What is meant by matplo lib?

14. What is meant by sampling?

15. What is the difference between numerical method and analytical method?

SECTION B — ($5 \times 5 = 25$)

Answer ALL questions, choosing either (a) or (b).

16. (a) What is tuple? What is the difference between list and tuple?

Or

(b) Explain function and module with suitable example.

17. (a) Write the difference between Numpy array and a list?

Or

(b) What is the importance of array in Python?

18. (a) What are the some important features of a good data visualization?

Or

(b) What are the different types of plots in matplotlib?