



K17U 1709

Reg. No. : .....

Name : .....

V Semester B.Sc. Degree (CBCSS-Reg./Sup./Imp.) Examination,  
November 2017  
(2014 Admn. Onwards)  
CORE COURSE IN PHYSICS  
5B09 PHY : Python Programming

Time : 3 Hours

Max. Marks : 40

SECTION – A

Answer **all**. Very short answer type. **Each** question carries 1 mark.

1. Write the output of python code  
 $2 * 3 + 4/2$
2. `linalg()` is used to find \_\_\_\_\_ of a matrix.
3. For data visualization the package using in python programming is
4. Write the function in math module to find factorial of a number. (4×1=4)

SECTION – B

Answer **any seven**. Short answer type. **Each** question carries 2 marks.

5. Write the use of colon character in python.
6. What is indentation in python ?
7. Write a program to find out area and perimeter of a circle, if radius is given.
8. What are packages ? Give one example.
9. Import numpy as np  
`a = np.arange(9.0).reshape([3,3])`  
`print a`  
What will be the output of this program ?
10. How can we save and restore a python file ?
11. Write a program to plot polar rose.
12. Write Taylor series expansion of  $\sin(x)$  and  $\cos(x)$ .
13. Give mathematical definition of derivative of a function  $f(x)$ .
14. What are the two modes of using python interpreter ? (7×2=14)

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SECTION – C

Answer **any four**. Short essay/problem type. **Each** question carries 3 marks.

15. How can we define and call a function ? Give one example.
16. Write a note on math module. Give any two methods to import pi value from math module.
17. Explain different ways to create arrays.
18. What are
  - 1) Spirals of Archimedes
  - 2) Fermats.
  - 3) Polar rose.
19. Find the root of  $x^3 - 18$  using bisection method.
20. Explain Runge Kutta method to solve differential equations. (4×3=12)

SECTION – D

Answer **any two**. Essay type. **Each** question carries 5 marks.

21. What are conditional executions used in python ? Illustrate with example.
22. Illustrate Fourier series. Write programs to generate square wave and sawtooth wave using this technique.
23. Create a  $3 \times 3$  matrix using random function. Save it as text file. After restoring it find inverse of the matrix.
24. Explain interpolation using Newton's polynomial. (2×5=10)