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Reg. No.....

SECOND SEMESTER M.Sc. DEGREE EXAMINATION, JUNE 2014

(CUCSS)

Physics

PHY 2C 08—COMPUTATIONAL PHYSICS

(2012 Admission)

me : Three Hours Maximum : 36 Weightage

Section A

Answer **all** *questions, each question carries weightage* 1.

1. What is a module in python ?
2. List the different operator in python.
3. With suitable example explain what is a random variable ?
4. Bring out the difference between log log ( ) and semilog x ( ).
5. Explain how to create an array from a regular python list.
6. Discuss the syntax of the function for saving and restoring arrays.
7. Explain with general format plot ( ) function and show ( ).
8. Write a program to plat exponential function in Python.
9. Find the inverse of a function $F(x) = 4x + 7$.
10. Discuss the interpolation with cubic spline and give its merits.
11. State and explain Bolzano's theorem.
12. What is the principle of logistic map ?

(12 × 1 = 12 weightage)

Section B

Answer any **two** *questions, each has weightage* 6.

13. What is Python ? Discuss its features. List and explain the rules for local variables and global variables in Python.
14. What is the difference between tuple and a list. Explain the main operator on a dictionary.

Turn over

15. Explain Monte-Carlo simulation. How it used to integrate a function over a complicated don

16. Define DFT for a sequence $x(n)$. Explain how to calculate DFT of N sampled points and wr program.

(2 × 6 = 12 weigh

Section C

Answer any **four** *questions, each has a weightage* 3.

17. Write a program to find largest and smallest in a set of numbers.

18. Write a program to find the biggest three numbers.

19. Find the inverse of $f(x) = \frac{x+1}{x}$.

20. Suppose $s(x) = \begin{cases} 0 & x \le 2 \\ (x-2)^3 & 2 < x \end{cases}$. Is $s(x)$ a cubic spline ? Justify.

21. Write a program to plot v-t graph of simple harmonic oscillator.

22. Write an algorithm for evaluating the value of π by Monte-Carlo simulations.

(4 × 3 = 12 weight