Reg. No.:……..…… Name :…….……..…….. **U 15124**

BSc DEGREE END SEMESTER EXAMINATION - OCTOBER 2015

SEMESTER - 1: PHYSICS (CORE COURSE)

COURSE - 15U1CRPHY1: METHODOLOGY IN PHYSICS

Time: Three Hours Max. Marks: 60

Part A

Very Short Answer Questions. Answer **all** questions briefly. Each question carries 1 mark.

1. What are de-Broglie waves?
2. List a few applications of nanomaterials in our daily life?
3. What is hypothesis and scientific theory?
4. To measure large distances, we use --------- (travelling microscope, meter scale, radar)
5. Quartz clocks show relatively accurate time at all temperatures. Comment on it.
6. Distinguish between angstrom unit (A^o) and astronomical unit(AU).
7. The number of significant figures in the number $1.200x10^3$ is ---------- (2,3,4)
8. What are absolute and relative errors?

(1 x 8 = 8)

Part B

Brief Answer Questions. Answer any **6** questions.
Each question carries 2 mark.

9. Explain the fundamental interactions in nature.
10. State and explain the importance of Chandrasekhar limit.
11. Briefly explain the principle and working of an analogue multimeter.
12. The accuracy of the observations increases with decrease in least count. Justify with an example.
13. State Kepler's laws of planetary motion.What is the significance of the laws?
14. The least count of a stop watch is 0.1s.The time of 20 oscillations of the pendulum is found to be 20s.What would be the percentage error in the time period?
15. Explain the main parts of a spectrometer.
16. Write down Einsten's photoelectric equation Explain the terms..

(2 x 6 = 12)

Part C

Problems/Derivations. Answer any **4** questions. Each question carries 5 mark.

17. Explain the contributions of C.V.Raman and S.N. Bose towards physics.
18. An analogue multimeter is given to identify the components such as an electrolytic capacitor, a p-n junction diode and an inductance. How will you identify them by noting their deflections?
19. The period of oscillation of a simple pendulum turns out to be 2.63s, 2.56s, 2.42s, 2.71s, and 2.80s.Find (a) true period of oscillation (b) absolute error in each

measurement (c) mean absolute error (d) fractional error and (e) period of the simple pendulum with error limits.

20. Parallax angle of a heavenly body measured from two points diametrically opposite on the equator of the earth is 1 miniute.If the radius of the earth is 6400km, find the diameter of the heavenly body from the earth?
21. Explain how the inner and outer volumes of a given hollow cylinder can be estimated by using Vernier Calipers.
22. Explain how Maxwell unified electricity, magnetism, and optics.

(5 x 4 = 20)

Part D

Long Answer Questions. Answer any **2** questions. Each question carries 10 mark.

23. Explain the geocentric and heliocentric models of the universe.
24. Explain the principle and working of a suspended type moving coil galvanometer. How a galvanometer can be converted in to an ammeter and a voltmeter?
25. Explain how we can detect and locate the far off objects and targets by using the techniques such as Radar, Sonar, Laser range finder and GPS.
26. Define and classify different types of errors in instruments and their statistical analysis, and how the errors can be minimized?

(10 x 2 = 20)

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