Reg. No…….. Name…… **18U127**

B. Sc. DEGREE END SEMESTER EXAMINATION - OCTOBER/NOVEMBER 2018

SEMESTER **– 1: PHYSICS (CORE COURSE)**

COURSE: **15U1CRPHY1: METHODOLOGY IN PHYSICS**

(Common for Regular 2018 admission and improvement 2017/ supplementary 2017/2016/2015/admission)

Time: Three Hours Max. Marks: 60

PART A

*Answer **all** questions briefly. Each question carries **1** mark*

1. What is a matter wave?
2. How "Big Bang" theory explained the formation of universe?
3. Differentiate hadrons and leptons.
4. What is "mean solar second"?
5. It is given that the value of one main scale division of a travelling microscope is 0.5mm and the vernier scale divisions are 50, which coincides with 49 main scale divisions. Find the least count.
6. How a LASER range finder works?
7. Define relative error.
8. Write down the number of significant figures in (i)0.038; (ii)4.590×10^7m. (1 x 8 = 8)

PART B

*Answer **any Six** questions. Each question carries **2** marks*

9. State Kepler's laws of planetary motion.
10. What are the fundamental interactions?
11. Find the energy equivalent of 1 kg of matter.
12. How did Einstein explain the Photoelectric effect?
13. How can we measure the diameter of a planet by stellar parallax?
14. Explain the functioning of a pendulum clock.
15. Give the classification of errors.
16. Explain histogram. (2 x 6 = 12)

PART C

*Answer **any Four** questions. Each question carries **5** marks*

17. In a laboratory two particles are observed to travel in opposite directions with speed $2.80 \times 10^8 ms^{-1}$. Deduce the relative speed.
18. Explain the principle of angle measurement with the help of a spectrometer.
19. A moving coil galvanometer of resistance 100Ω is used as an ammeter using a shunt resistance of 0.1Ω. The maximum deflection current in the galvanometer is 100μA. Find the current in the circuit, so that the ammeter shows maximum deflection

20. The length and breadth of a rectangular object are 28.2cm and 15.8cm respectively. They have been measured to an accuracy of 0.1cm. Find the percentage error in area.
21. While measuring the thickness of a glass plate following readings are recorded: 3.9, 3.7, 3.8, 4.0, 4.1, 4.2, 3.8, 3.9, 4.1, and 3.9. Calculate the mean, standard deviation and the probable error of mean.
22. In an experiment to find the rigidity modulus of the material of a wire, the formula used is rigidity modulus $k = 4\pi I\, MR^2 / T^2r^4$. A student when measuring the values reports errors as 5% in I, 7% in R, 10% in T and 20 % in r. How much would be the error in reporting the rigidity modulus?

(5 x 4 = 20)

PART D

*Answer **any Two** questions. Each question carries **10** marks*

23. Briefly discuss the contribution of Indian scientists in the field of physics.
24. Explain the breakdown of classical theory and emergence of quantum theory.
25. What is a galvanometer? Explain its working principle. With neat circuit diagrams explain how a galvanometer can be converted into an ammeter and a voltmeter.
26. Describe propagation of errors. Also discuss the needs and methods of calibration

(10 x 2 = 20)

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