TB141340

B.Sc DEGREE (C.B.C.S.S.) EXAINATION, NOVEMBER 2014
BSC PHYSICS – FIRST SEMESTER
CORE COURSE (FOR PHYSICS MODEL 1)
PHY1MP- METHODOLOGY IN PHYSICS

Time : 3Hours   **Maximum : 60 marks**

(Candidates can use Clark's tables and scientific non-programmable calculators)

Part A
Very short answer questions
*Answer **all** questions briefly. Each question carries 1 mark.*

1. Explain the phenomenon of electromagnetic induction.

2. State Copernicus's heliocentric theory.

3. State Hubble's law.

4. Differentiate between intrinsic and extrinsic semiconductors..

5. What is meant by least count of an instrument?

6. What are the postulates of Einstein's theory of relativity?

7. What is a histogram?

8. Give the number of significant digits in 0.046.   **(8x1=8)**

Part B
Short answer questions
*Answer any **Six** questions. Each question carries 2 marks.*

9. Explain the terms deferent and epicycle.

10. Explain how classical theory fails to explain the stability of the atom.

11. Derive Einstein's photoelectric equation.

12. Explain the formation of white dwarfs.

13. What is meant by red shift? What is its significance?

14. What is a sundial? Explain its working.

15. List the seven basic units of the SI system.

16. What is meant by absolute error in an instrument?

(P.T.O)

17. What do you mean by sensitivity of an instrument?

18. How many digits should be there in the answer if Sin (kx) is calculated with $k=0.097m^{-1}$ and $x=4.73m$?

<div align="right">**(6x2=12)**</div>

Part C
Problems / Derivations
*Answer any **Four** questions. Each question carries 4 marks.*

19. What are the advantages and disadvantages of Peer review in the process of academic publishing?

20. Write a note on the contributions of Meghnath Saha.

21. Explain how an optic lever can be used to measure the thickness of a glass plate.

22. 5.74g of a substance occupies 1.2cc. Express its density by keeping the significant figures in view.

23. Given $Z = \dfrac{A^{\frac{3}{2}} BC^{2}}{D\sqrt{E}}$, A=12.3cm, B=5cm, C=8.2cm, D= 10cm and E=12cm.

    If the errors in the values of A, B, C, D & E are 0.1, 0.01, 0.2, 0.03 and 0.1 respectively, estimate the percentage error in the value of Z.

24. Lengths of 5cm rod and 50cm rod are measured using a meter scale. Which measurement will be more accurate? Why?

<div align="right">**(4x4=16)**</div>

Part D
Long answer / Problem questions
*Answer any **Two** questions. Each question carries 12 marks.*

25. Classify the fundamental interactions. Explain the features, type of particles and mediators involves in each class.

26. Explain how errors are classified. Bring out the importance of estimating errors.

27. a) Explain how a galvanometer can be converted to a voltmeter and an ammeter.

    b) A galvanometer with a coil of resistance 12 ohms shows full scale deflection for a current of 2.5mA. How will you convert the meter into an ammeter of range 0-7.5A and a voltmeter of range 0-10V.

28. Explain the working of a pendulum clock. What are the possible sources of error and how can these be rectified.

<div align="right">**(2x12=24)**</div>