K16U 2508

Reg. No. : .....

Name : .....

I Semester B.Sc. Degree (C.C.S.S. – Reg./Supple./Improv.) Examination, November 2016
CORE COURSE IN PHYSICS
1B01 PHY : Physics Primers
(2014 Admn. Onwards)

Time : 3 Hours Total Marks : 40

Instruction : *Write answers* ***only*** *in* ***English.***

SECTION – A

Answer **all** questions – Very short answer type, **each** question carries **1** mark.

1. $\nabla \cdot B = 0$ means B is _____
2. According to Planck's theory light is photon having packets of energy called _____
3. Maximum attainable velocity for an object, according to Einstein's theory is _____
4. The rest mass of Photon is _____ **(4×1=4)**

SECTION – B

Answer **any seven** – Short answer type, **each** question carries **2** marks.

5. What is Laplacian ?
6. State Einstein's special theory of relativity.
7. Explain equation for wave motion.
8. What is Transverse wave ? Give its figure and one example.
9. Explain Hubble's law.
10. What is Curl-less field ?
11. What are the contributions of C.V. Raman to the scientific world ?

P.T.O.

12. Prove curl of a gradient is always zero.

13. Write about Scalar Triple Product.

14. Discuss Vibrational states of Diatomic molecules. **(7×2=14)**

SECTION – C

Answer **any four** – Short essay/problem type, **each** question carries **3** marks.

15. Explain simple pendulum.

16. Show that the total energy of a harmonic oscillator at an instant is a constant.

17. A longitudinal disturbance generated by an earthquake travels 1000 km in 3 minutes. If the average density of the rock is assumed to be 2700 kg/m^3. Calculate the bulkmodulus of the rock.

18. Check the force $F = (y^2 - x^2)\, i + 3xyj$ is conservative or not.

19. Explain the fundamental theorems for gradient , divergence and curls.

20. Give the volume element for spherical polar coordinate and hence find out the volume of a Sphere of radius R. **(4×3=12)**

SECTION – D

Answer **any two** – Long essay type, **each** question carries **5** marks.

21. What is ultra violet catastrophy ? How this discrepancy was solved ?

22. What is a harmonic oscillator ? Solve the differential equation of a harmonic oscillator and find the expression for its velocity, period and displacement.

23. Discuss about Fourier analysis and Fourier theorem.

24. Explain Transverse wave in stretched string and modes of transverse vibrations in a string. **(2×5=10)**
