



M 7847

Reg. No. :

Name :

I Semester B.Sc. Degree (CCSS – Regular) Examination, November 2014
(2014 Admn.)

CORE COURSE IN PHYSICS
1B01 PHY : Physics Primers

Time: 3 Hours

Max. Marks : 40

Instruction : Write answers in English only

SECTION – A

Answer **all**. Very short answer type. **Each** question carries **one** mark.

1. The differential equation representing Simple Harmonic Motion _____
2. The phenomenon of polarization is not observed in sound because, Sound is _____ wave.
3. _____ is an Example of curl less field.
4. Rayleigh-Jeans formula was introduced to explain _____

SECTION – B

Answer **any seven**. Short answer type. **Each** question carries **two** marks.

5. What is ultraviolet catastrophe ?
6. Write a note on cylindrical polar coordinate system.
7. What is Del operator ?
8. Give physical significance of gradient of a scalar function.
9. State Stokes theorem.
10. What is meant by Simple Harmonic Motion ?
11. What is Fourier theorem ? Explain its importance.

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12. What are Lissajous figures ?
13. Write a note on contributions of Indian physicists in twentieth century.
14. Write a note on Expanding Universe.

SECTION – C

Answer **any four**. Short essay/problem type. **Each** question carries **three** marks.

15. Briefly explain Planck's explanation of black body radiation.
16. A plane wave of sound of frequency 512 Hz and amplitude 0.005 mm is travelling in air. Calculate the energy transmitted per unit volume. Also calculate the energy current. (Given velocity of sound in air 340m/s and density of air 1.3kg/m^3 .)
17. A body of mass 1kg connected with a mass less horizontal spring of force constant 1N/m is set into Simple Harmonic Oscillations. Find the period of oscillation.
18. Prove that $\text{div curl}(\mathbf{F}) = 0$.
19. Express v_2 in spherical polar coordinates.
20. Discuss the composition of two simple harmonic motions of equal periods and equal amplitudes with a phase difference of 90° .

SECTION – D

Answer **any two**-long essay type. **Each** question carries **five** marks.

21. Obtain the transformation and reverse transformation equations between Cartesian coordinates and Spherical Polar coordinates.
22. State and prove Gauss's theorem.
23. What is meant by standard model in high energy physics ? What are the various particle families in the standard model ? Explain Higgs mechanism.
24. Explain what is meant by natural frequency and resonance. Obtain the natural frequency and overtones in pipes with both ends open, with the help of a neat diagram.