M 7848

Reg. No. : .....

Name : .....

I Semester B.Sc. Degree (CCSS – Regular) Examination, November 2014
(2014 Admn.)
COMPLEMENTARY COURSE IN PHYSICS
1C01 PHY : Mechanics

Time : 3 Hours Max. Marks : 32

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. Young's Modulus is defined as _____
3. Expression for de-Broglie wavelength λ = _____
4. Energy of a simple harmonic oscillator is _____
5. The proposer of Uncertainty Principle is _____ **(5×1=5)**

SECTION – B

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

6. What is Poisson's ratio ? What are the theoretical limits of Poisson's ratio ?
7. State and prove perpendicular axis theorem.
8. Distinguish between transverse and longitudinal waves ? Give one example for each.
9. What is radius of gyration ?
10. Assuming the expression for moment of inertia of a ring, find the moment of inertia of a disc.
11. What is meant by Simple Harmonic Motion ? **(4×2=8)**

P.T.O.

SECTION – C

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

12. Derive an expression for couple per unit twist of a cylindrical rod.

13. What are the characteristics of a damped harmonic oscillator ? Define Q-factor.

14. 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.

15. Calculate the de-Broglie wavelength of an electron accelerated through a potential difference of 100V.

16. The uncertainty in the measurement of position of a particle is 0.3%, what is the uncertainty in measuring the velocity of the particle. **(3×3=9)**

SECTION – D

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

17. Derive an expression for the moment of inertia of a disk about an axis along a chord distant d from the centre of the disk.

18. Obtain time-independent Schrodinger equation.

19. Derive an expression for the time period of a simple harmonic oscillation.

20. Obtain an expression for the velocity of transverse vibrations in a stretched string. **(2×5=10)**
