K17U 2552

Reg. No. : .....

Name : .....

I Semester B.Sc. Degree (CBCSS – Reg./Supple./Improv.) Examination, November 2017
COMPLEMENTARY COURSE IN PHYSICS
1C01 PHY : Mechanics
(2014 Admn. Onwards)

Time : 3 Hours

Max. Marks : 32

Instruction : *Answer the questions in* ***English*** *only.*

SECTION – A

Very short answer type. **Each** carries **1** mark. Answer **all 5** questions.

1. The Young's modules of a perfectly rigid body is _____
2. Write the general equation representing a plane progressive wave.
3. The dimension of force constant is _____
4. In general motion of a rigid body has _____ degrees of freedom.
5. Write the time independent Schrodinger equation.

(1×5=5)

SECTION – B

Very short answer type. **Each** carries **2** marks. Answer **4** questions out of 6.

6. Which is more elastic steel or rubber ? Explain.
7. Explain the physical significant of the wave function ψ.
8. Distinguish between transverse and the longitudinal waves with examples.
9. What is meant by free oscillation ?
10. State the laws of parallel and perpendicular axes theorems.
11. Derive one dimensional wave equation.

(2×4=8)

P.T.O.

SECTION – C

Short essay/problem type. **Each** carries **3** marks. Answer **3** questions out of **5**.

12. Why girders for supporting roofs are formed in the shape of I ?
13. Derive an expression for energy density of a progressive wave.
14. Explain the variation of kinetic and potential energies of a simple harmonic oscillator. Illustrate your answer with suitable graph.
15. Find the moment of inertia of an annular ring about axes passing through its centre an Perpendicular to its plane.
16. Calculate the deBroglie wavelength associated with a proton moving with a velocity $^1/_{20}{}^{th}$ of the velocity of light. **(3×3=9)**

SECTION – D

Long essay type. **Each** carries **5** marks. Answer **2** questions out of **4**.

17. What are the basic postulates of wave mechanics ? Derive Schrodinger time dependent wave equation.
18. What is a damped harmonic oscillator ? Setup the differential equation of a damped harmonic oscillator.
19. What is a cantilever ? Obtain an expression for the depression produced at its free end which is load and Neglecting the weight of the beam.
20. Define moment of inertia. Describe how you would determines experimentally the moment of inertia of Flywheel about its usual axis of rotation. **(5×2=10)**
