



K25U 3375

Reg. No. :

Name :

First Semester B.Sc. Degree (C.B.C.S.S. – O.B.E. – Supplementary)

Examination, November 2025

(2019 to 2023 Admission)

COMPLEMENTARY ELECTIVE COURSE IN PHYSICS

1C01 PHY : Mechanics

Time : 3 Hours

Max. Marks : 32

SECTION – A

All questions are compulsory. Each question carries 1 mark. (5×1=5)

1. The amplitude of under damped oscillator _____.
2. The moment of inertia of a disc about an axis passing through the centre and perpendicular to its plane is
3. Write down the expression for terminal velocity.
4. What are the limiting values of Poisson's ratio ?
5. Write the expression for velocity of longitudinal wave in solids.

SECTION – B

Answer any 4 questions. Each question carries 2 marks. (4×2=8)

6. Define the terms angle of twist and angle of shear.
7. Derive the expression for frequency in LCR circuit.
8. Distinguish between streamline and turbulent flow.
9. Prove that total energy of simple harmonic motion is constant.
10. State and explain Parallel Axis theorem.
11. Write down the Newton's formula for velocity of sound.

P.T.O.



SECTION – C

Answer **any 3** questions. **Each** question carries **3** marks.

(3×3=9)

12. A metallic wire of length 1 m and diameter 3 mm is subjected to a stress produce an elongation 1 mm. If Poisson's ratio of the material is 0.3, find the decrease in diameter.
13. An air bubble of radius 1 cm is allowed to rise through a long cylindrical column of a viscous liquid and travels at a steady rate of 0.21 cms^{-1} . If the density of liquid is 1470 kgm^{-3} . Find its coefficient of viscosity. Neglect air resistance.
14. A particle is moving with simple harmonic vibrations has a period of 0.001 sec and the amplitude 0.5 cm. Find the acceleration when it is 0.2 cm apart from its mean position and its maximum velocity.
15. Find the moment of inertia of thin rod about an axis passing through the centre of mass and perpendicular to its length.
16. A simple pendulum has a period of 2 sec and amplitude 2° . After 10 complete oscillations its amplitude reduced to 1.5° . Find the relaxation time and damping constant.

SECTION – D

Answer **any 2** questions. **Each** question carries **5** marks.

(2×5=10)

17. Define Cantilever. Derive an expression for depression when loaded at free end.
 18. Explain the method of determination of moment of inertia of flywheel.
 19. Set up the differential equation for damped harmonic motion and derive the solution for under damped case.
 20. Derive an expression for energy density of plane progressive wave.
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