



K21U 6567

Reg. No. :

Name :

I Semester B.Sc. Degree (CBCSS – Supplementary)
Examination, November 2021
(2015 – 2018 Admissions)
COMPLEMENTARY COURSE IN PHYSICS
1C01PHY : Mechanics

Time : 3 Hours

Max. Marks : 32

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

SECTION – A

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

1. Dimensional formula of stress is _____.
2. In order to reduce the depression generated in a beam when loaded at one end, the Young's modulus of the material must be _____.
3. In CGS system, the unit of moment of inertia is _____.
4. Is the time period of a compound pendulum depended on its mass _____.
5. The amplitude of damped simple harmonic oscillator _____ (5×1=5)

SECTION – B

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

6. What are the properties of a well behaved wave function ?
7. State theorems of parallel and perpendicular axes.
8. What is angle of twist and angle of shear ?
9. Draw the energy graph showing the potential energy, kinetic energy and total energy of a particle executing harmonic oscillatory motion.
10. What is a quality factor ? What are its unit ?
11. What do you understand by longitudinal wave ? Give an example. (4×2=8)

P.T.O.



SECTION – C

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

12. The uncertainty in the momentum Δp of a ball travelling at 20m/s is $1 \times 10^{-6} \times 10^{-6}$ of its momentum. Calculate uncertainty in position Δx ? Mass of the ball is given as 0.5 kg.
13. Show that a greater couple is required to twist a hollow cylinder as compared to the solid one.
14. What do you mean by modes of vibration ? Explain.
15. A 4 kg mass attached to a spring is observed to oscillate with a period of 2 seconds. What is the period of oscillation if a 6 kg mass is attached to the spring ?
16. A thin uniform rod of length 1 m and mass 1 kg is rotating about an axis passing through its centre and perpendicular to its length. Calculate the moment of inertia and radius of gyration of the rod about an axis passing through a point midway between the centre and its edge perpendicular to its length. **(3×3=9)**

SECTION – D

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

17. Show that in a linear bounded medium the rate of transference of energy is zero.
 18. What is damped harmonic oscillator ? Obtain an equation for a damped harmonic motion.
 19. Derive Davisson-Germer experiment. Comment on the results.
 20. What is moment of inertia ? Derive the moment of inertia of a thin uniform rod about an axis passing through its centre of mass and perpendicular to its length and also about an axis passing through one end of the rod. **(2×5=10)**
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