

SECOND REVISION TEST - 2023

Exam No.

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Time : 3-00 Hours

XI - PHYSICS

Marks : 70

PART - I**Note:1) Answer all the questions.****2) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer. (15x1=15)**

1. If a particle has negative velocity and negative acceleration, its speed
 - a) increases
 - b) decreases
 - c) remains same
 - d) zero
2. The kinetic energy of a body of mass 4kg and momentum 6Ns will be
 - a) 3.5J
 - b) 5.5J
 - c) 2.5J
 - d) 4.5J
3. Which of the following pairs of physical quantities have same dimension?
 - a) force and power
 - b) torque and energy
 - c) torque and power
 - d) force and torque
4. If a person moves from Chennai to Trichy, his weight
 - a) increases
 - b) decreases
 - c) remains same
 - d) increases and then decreases
5. A small sphere of radius 2cm falls from rest in a viscous liquid. Heat is produced due to viscous force. The rate of production of heat when the sphere attains its terminal velocity is proportional to
 - a) 2^2
 - b) 2^3
 - c) 2^4
 - d) 2^5
6. In hot summer after a bath, the body's
 - a) internal energy decreases
 - b) internal energy increases
 - c) heat decreases
 - d) no change in internal energy and heat
7. Which of the following has maximum Young's modulus?
 - a) Steel
 - b) Copper
 - c) Brass
 - d) Aluminium
8. A sample of ideal gas is at equilibrium. Which of the following quantity is zero?
 - a) rms speed
 - b) average speed
 - c) average velocity
 - d) most probable speed
9. The working of venturimeter is based on
 - a) Torricelli's Law
 - b) Pascal's Law
 - c) Bernoulli's Theorem
 - d) Stoke's Law
10. The temperature on a Fahrenheit scale is 98.6°F , what is the corresponding temperature on a Kelvin scale?
 - a) 310.2K
 - b) 280.3K
 - c) 420.5K
 - d) 370.6K
11. If the temperature of an ideal gas increases three times, then its rms velocity will become
 - a) $\sqrt{3}$ times
 - b) 3 times
 - c) $1/3$ times
 - d) remains same
12. A sound wave whose frequency is 5000Hz travels in air and then hits the water surface. The ratio of its wavelengths in water and air is
 - a) 4.30
 - b) 0.23
 - c) 5.30
 - d) 1.23
13. Longitudinal wave can travel in
 - a) solids only
 - b) liquids only
 - c) liquids and gases only
 - d) all medium

14. Human audible wavelength range (velocity of sound in air = 340ms^{-1})
 a) 17m to 170m
 b) 0.17m to 17m
 c) 0.017m to 17m
 d) 1.7m to 17m
15. The work done by the conservative force for a closed path is
 a) always negative
 b) zero
 c) always positive
 d) not defined

PART - II

Note: Answer any six of the following questions.

Question Number 24 is compulsory.

(6x2=12)

16. Write any two limitations of dimensional analysis.
17. The position vector and angular velocity vector of a particle executing uniform circular motion at an instant are $2\hat{i}$ and $4\hat{k}$ respectively. Find its linear velocity at that instant.
18. Define potential energy.
19. Define beats.
20. What is radius of gyration?
21. Why does heat flow from a hot object to a cold object?
22. State Newton's Universal Law of gravitation.
23. State Pascal's Law in fluids.
24. Write down the kinetic energy and total energy expressions in terms of linear momentum, For one-dimensional case.

PART - III

Note: Answer any six of the following questions.

Question No.33 is compulsory.

(6x3=18)

25. Explain RADAR pulse method for determining large distance.
26. Write down the expression for angle made by resultant acceleration and radius vector in the non uniform circular motion.
27. Show that impulse is the change of momentum.
28. Write the differences between elastic and inelastic collision.
29. A cyclist while negotiating a circular path with speed 20ms^{-1} is found to bend an angle by 30° with vertical. What is the radius of the circular path?
 (given, $g=10\text{ms}^{-2}$)
30. State Kepler's three laws.
31. Deduce Avogadro's Law based on Kinetic Theory.
32. Define intensity of sound and loudness of sound.
33. During a cyclic process, a heat engine absorbs 500J of heat from a hot reservoir, does work and ejects an amount of heat 300J into the surroundings (cold reservoir). Calculate the efficiency of the heat engine?

PART - IV

Note: Answer all the questions.

(5x5=25)

34. a) Explain in detail the triangle law of addition.
 (OR)
 b) Derive an expression for escape speed.
35. a) Explain the need for banking of tracks.
 (OR)
 b) Derive Poiseuille's formula for the volume of a liquid flowing per second through a pipe under streamlined flow.
36. a) Write short notes on the following.
 a) Unit b) Rounding-off c) Dimensionless quantities
 (OR)
 b) Derive the work done in an adiabatic process.
37. a) How will you determine the velocity of sound using resonance air column apparatus?
 (OR)
 b) Arrive at an expression for power and velocity.
38. a) Derive the expression for moment of inertia of a rod about its centre and perpendicular to the rod.
 (OR)
 b) Explain in detail the four different types of oscillations.