COMMON SECOND REVISION TEST – 2023

Standard XI

Reg.No.:

PHYSICS

Part - I

Time: 3.00 hrs. Marks: 70

15 x 1 = 15

I. Choose the correct answer:

1. The frequency width of the "Audible waves" _____
   a) 20 Hz to 200 Hz b) 20 Hz to 2000 Hz
   c) 20 Hz to 20000 Hz d) 20 Hz to 20000 KHz
2. A sound wave whose frequency is 5000 Hz 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
3. The damping force on an oscillator is directly proportional to the velocity. The units of the constant of proportionality are
   a) kg m s^{-1} b) kg m s^{-2} c) kg s^{-1} d) kg s
4. Which of the following gases will have least RMS (v_{rms}) speed at a given temperature?
   a) hydrogen b) nitrogen c) oxygen d) carbon dioxide
5. When a cycle tyre suddenly bursts, the air inside the tyre expands. This process is
   a) isothermal b) adiabatic c) isobaric d) isochoric
6. One calorie equal to _____
   a) 4.186 J b) 41.86 J c) 418.6 J d) 4186 J
7. If the temperature of the wire is increased, then the Young's modulus is
   a) remains the same b) decrease
   c) increase rapidly d) increase by very small amount
8. A fluid has Reynold's number R_c as $R_c < 1000$, then the motion of the fluid is _____
   a) turbulent b) unsteady
   c) turbulent & unsteady d) streamline
9. If the acceleration due to gravity becomes 4 times its original value, then escape speed
   a) remains same b) 2 times of original value
   c) becomes halved d) 4 times of original value
10. 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
11. Identify the unit vector in the following :
    a) $\hat{i} - \hat{j}$ b) $\frac{\hat{i}}{\sqrt{2}}$ b) $\hat{k} - \frac{\hat{j}}{\sqrt{2}}$ d) $\frac{\hat{i} + \hat{j}}{\sqrt{2}}$
12. The work done by the conservative force for your closed to path is
    a) always negative b) zero
    c) always positive d) not defined
13. A couple produces _____
    a) pure rotation b) pure translation
    c) rotation and translation d) no motion
14. The unit of impulse is _____
    a) NC^{-1} b) NC^{-} c) Ns d) Ns^{-1}
15. "One Parsec" is equal to the value of _____
    a) 326 light year b) 32.6 light year c) 3.26 light year d) 0.326 light year

Part - II

II. Answer any 6 questions. (Q.No.24 is compulsory) **6 x 2 = 12**

16. State conservation of angular momentum.
17. The astronauts inside a satellite are in the state of weightlessness. Why?
18. Define Power
19. What is called Inertia?
20. State Bernoulli's theorem.
21. What is mean by 'Beats'?
22. What are the factors affecting Brownian motion?
23. State Zeroth the law of thermodynamics
24. From a point on the ground, the top of a tree is seen to have an angle of elevation 45°. The distance between the tree and a point is 50 m. Calculate the height of the tree.

Part - III

III. Answer any 6 questions. (Q.No.33 is compulsory) **6 x 3 = 18**

25. Describe Newton's formula for velocity of sound waves in air.
26. Locate the centre of mass of a uniform rod of mass M and length *l*.
27. State Newton's three laws of motion.
28. Explain an "anomalous expansion" of water.
29. Explain the laws of simple pendulum.
30. Write down the postulates of kinetic theory of gases. (any six)
31. Explain the variation of 'g' with altitude.
32. Distinguish between "Centre of mass" & "Centre of gravity".
33. An athlete covers 3 rounds on a circular track of radius 50 m. Calculate the total distance and displacement travelled by him.

Part - IV

IV. Answer all the questions. **5 x 5 = 25**

34. a) Write down the applications and limitations of dimensional analysis.

(OR)

b) How will you determine the velocity of sound using resonance air column apparatus? Explain.

35. a) Discuss the properties of vector products.

(OR)

b) Derive an expression for velocities of objects for elastic collision in one dimension.

36. a) Obtain an expression for the surface tension of a liquid by capillary rise method.

(OR)

b) State and prove parallel axis theorem.

37. a) What is meant by escape speed? Derive an expression for the escape speed of an object.

(OR)

b) Derive the expression for mean free path of the gas.

38. a) What is meant by angular harmonic oscillations? Compute the time period of angular harmonic oscillation.

(OR)

b) Explain the method of working of Carnot heat engine with the help of PV-diagram.

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