Roll No .....

Total No. of Questions : 22] [Total No. of Printed Pages : 8

11th ARNKD(W/Z) JKLUT-2025

1208-A

PHYSICS

Time : 3 Hours] [Maximum Marks : 70

Note:- "Attempt any 60 Marks out of 70 Marks".

SECTION-A

(Objective Type Questions)

(1 mark each)

1. (i) The number of significant figure in 2.64×10^{24} Kg is:

(a) 3

(b) 4

(c) 24

(d) 1

(ii) The correct relation between Light year and metre is:

(a) 1 Light year = 7.469×10^{15} m

(b) 1 Light year = 4.2 m

(c) 1 Light year = 9.467×10^{15} m

(d) None of them

(iii) At what point in its trajectory does a projectile have minimum upward speed.

(a) At the start of the Trajectory

(b) At the end of the Trajectory

(c) At the midpoint of the Trajectory

(d) At the highest point in its Trajectory

(iv) Momentum is measured in :

(a) Kgsm s^{-1}

(b) Kgm s^{-2}

(c) Kgm s

(d) Kgm

(v) A needle floats on the surface of water because of :

(a) Lighter weight

(b) Surface tension

(c) Adhesive force

(d) Viscosity

(vi) The meniscus of mercury in a glass tube is:

(a) Concave upward

(b) Convex upward

(c) Plane

(d) None of the above

(vii) The work done in an isothermal expansion of a gas depends upon:

(a) Temperature only

(b) Expansion ratio only

(c) Both of them

(d) None of them

(viii) On the basis of absolute zero as the scale of temperature, the i

melts at:

(a) 100°

(b) 273.15 K

(c) 373.15 K

(d) None of them

(ix) Two vessels A and B of the same size are at the same temperature

one of them holds 1Kg of H_2 gas and the other hold 1Kg of N_2 gas

Which of the vessels contains more molecules?

(a) A only

(b) B only

(c) Both (a) and (b)

(d) None of them

(x) The relation between pressure and energy is:

(a) $P = \frac{2}{3} E$

(b) $P = 3/2\ E$

(c) $E = \frac{1}{2} \rho c^2$

(d) None of them

SECTION-B

(Very Short Answer Type Questions)

(2 marks each)

2. Define angular momentum. Give its unit and dimensional formula..

3. Write the comparison of translational and rotational motion.

4. State the physical significance of moment of inertia.

5. Define surface energy. Write relation between surface tension and surface energy.

6. Is a reversible process really possible in practice? Discuss briefly.

7. What are cyclic and non-cyclic processes?

8. Write down the four assumptions of Kinetic theory of gasses.

9. Write down the expression for the pressure of a gas in terms of density.

10. What is meant by restoring force and force constant?

SECTION-C

(Short Answer Type Questions)

(3 marks each)

11. Write the uses and limitations of the dimensional analysis.

12. Derive an equation of trajectory of projectile fired at an angle.

13. A cricket ball is rolled on ice with a velocity of 5.6 m/s and comes to rest after travelling 8 metre. Find the coefficient of friction. ($g = 9.8\ m/s^2$).

14. State Newton's first and second laws of motion, also define one Newton of force.

15. A body of mass 10 kg initially at rest is subjected to a force of 40 N. What is the kinetic energy acquired by the body at the end of 10 sec?

16. Distinguish between elastic and inelastic collisions.

17. At what height above earth's surface, value of "g" is same as in a 100 km deep mine?

18. Find an expression for the gravitational potential energy of a body situated at a distance "r" from the centre of earth.

19. At what distance from the mean position is kinetic energy equal to potential energy? Briefly explain in case of S.H.M.

SECTION-D

(Long Answer Type Questions)

(5 marks each)

20. What do you mean by resolution of a vector? Find rectangular components of a vector.

OR

From the velocity-time graph of uniform accelerated motion, deduce the equations of motion in

(i) Velocity and time (ii) Position and time

21. What do you mean by terminal velocity? Derive an expression for it.

OR

Explain modes of transfer of heat with example.

22. Discuss the harmonics in the case of open end organ pipes.

OR

Derive an expression for velocity and acceleration of a particle executing simple harmonic motion.

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