11th ARNKD(W/Z) JKLUT-2025

1208-B

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 0.0006032 is:

    (a) 6

    (b) 3

    (c) 2

    (d) 4

(ii) Which one is the correct relationship between Angstrom and Astronomical unit?

(a) $1 \, A° = 10^{-10} \, m$

(b) $1 \, AU = 1.4 \times 10^{11} \, m$

(c) $1 \, A = 1.496 \times 10^{11} \, m$

(d) None of them

(iii) At the top of the trajectory of a projectile, the direction of its velocity and acceleration are:

(a) Parallel to each other

(b) Antiparallel to each other

(e) Inclined to each other at an angle of $45°$

(d) Perpendicular to each other.

(iv) Action 4 reaction forces do not balance each other because they:

(a) Act on the same body

(b) Do not act on same body

(c) Are in opposite direction

(d) Are not equal

(v)   A liquid wets the surface of solid if the angle of contact is:

    (a)   Acute

    (b)   Obtuse

    (c)   Zero

    (d)   90°

(vi)   If temperature of Liquid is raised, its surface tension :

    (a)   Decreases

    (b)   Increases

    (c)   Remains same

    (d)   None of them

(vii)   In an adiabatic expansion of a gas the amount of work done depends upon.

    (a)   Change in temp

    (b)   Change in volume

    (c)   Change in pressure

    (d)   None of them

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

water boils 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 root mean square velocity and absolute temperature is:

(a) $C^2 \propto \sqrt{T}$

(b) $C^2 \propto T^2$

(c) $C \propto \sqrt{T}$

(d) None of them

SECTION-B

(Very short Answer Type Questions)

(2 marks each)

2. Define torque. What are its dimensions?

3. Compare the dynamics of Linear and rotatory motions.

4. Define the term radius of gyration, on what factors does it depends?

5. Define surface tension, write its units and dimensions.

6. What do you mean by Irreversible process? Give example.

7. What are cyclic and non-cyclic processes? $\frac{1}{2}$

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

9. Define Average speed and Root mean square speed of gas molecules.

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/s²).

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 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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