# CBSE Sample Papers for Class 11 Physics SET A

1. Give pratical unit of power.

2. What is ultimate or tensile strength ? (Hots)

3. What is an adiabatic process ?

4. What are elastomer's ? (Hots)

5. What is the basic condition for the motion of a particle to be S.H.M. ?

6. Derive S.I. unit of Joule (J) in terms of fundamental units.

7. "The direction in which an object moves is given by the direction of velocity of the object and not by the direction of acceleration." Explain with an example.

8. Find resultant of two vectors when the two vectors (a) along the same direction, (b) along opposite direction, (c) at right angles to each other.

**Or**
A force of 72 dyne is inclined to the horizontal at an angle of 60°. Find the acceleration in a mass of 9 g, which moves in a horizontal direction.

9. Why there are two propellers in the helicopter ?

10. The speed of sound waves depends on temperatre but speed of light waves does not. Why ?

11. Point out the measurable likely to create the maximum error in the following experimental measurement :

Young's Modulus of the material of the beam is calculated using the relation

$$Y = \frac{mgl^3}{4bd^3\delta}$$

when w = mg, 8 = depression; 1, b, d = length, breadth, thickness.

12. The position-time (x-t) graphs for two children A and B returning from their school 0 to their homes P and Q respectively are shown. Choose the correct entries :
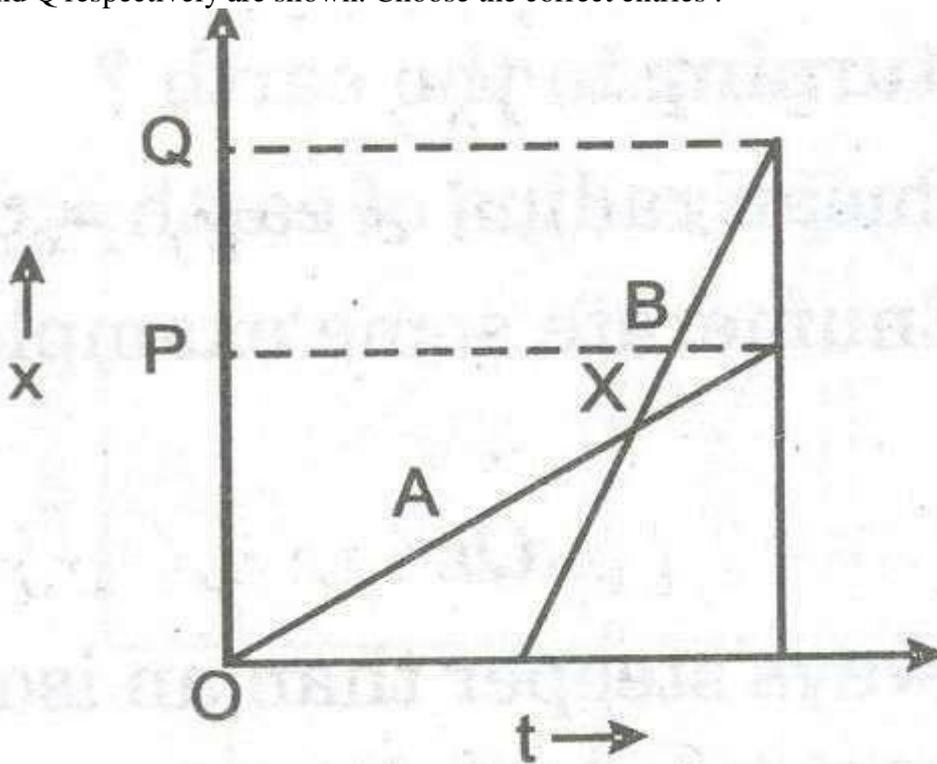


(a) (A/B) lives closer to the school than (B/A).
(b) (A/B) starts from the school earlier than (B/A).
(c) (A/B) walks faster than (B/A).
(d) A and B reach home at the (same/different) time. (HOTS)
(e) (A/B) overtakes (B/A) on the road (once/twice).

13. The position of a particle is given by
r = 3.0t – 2-0t²3 + 4.03k m,

where t is in seconds and the coefficients have the proper units for x to be in metres. (a) Find v and a of the particle ? (b) What is the magnitude and direction of velocity of the particle at t = 2.0 s?

14. A train rounds an unbanked circular bend of radius 30 m at a speed of 54 km h$^{-1}$. The mass of the train is $10^6$ kg. What provides the centripetal force required for this purpose ? The engine or the rails ? What is the angle of banking to prevent wearing out of the rail ?

15. What is coefficient of restitution ? Give its values for elastic collision, inelastic collision and perfectly inelastic collisions.

16. Show that momentum is conserved.

17. Does the escape velocity of body from the earth depend upon :
(a) the mass of the body ?
(b) the location from where it is projected ?
(c) the direction of projection ?
(d) the height of location from where the body is launched ?

18. Figure below corresponds to two circular motions. The radius of the circle, the period of revolution, the initial position, and the sense of revolution (i.e., clockwise or anticlockwise) are indicated on each figure.

Obtain the corresponding simple harmonic motion of the x-projection of the radius vector of the revolving particle P, in each case.



(a)

(b)
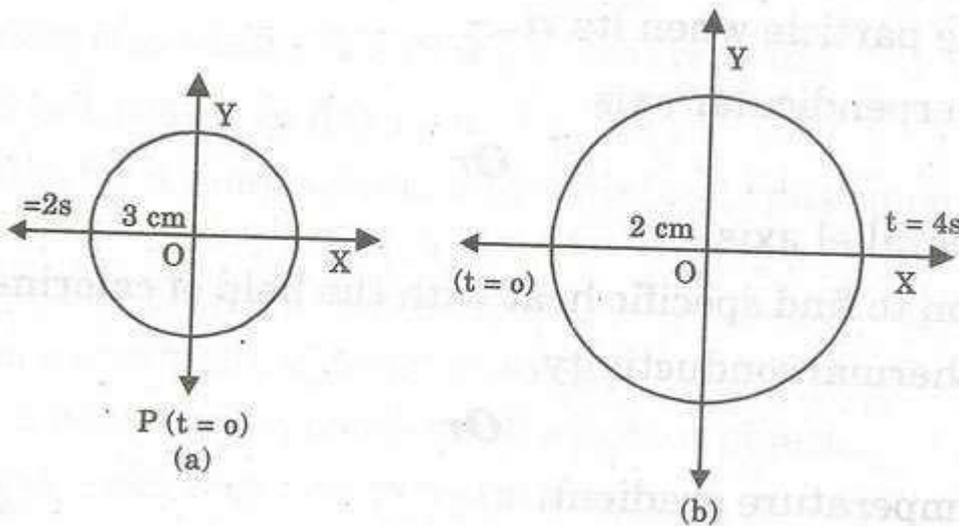
**Or**

What is transverse wave motion. Give examples.

19. (a) In deriving Bernoulli's equation, we equated the work done on the fluid in the tube to its change in the potential and kinetic energy.(a) How does the pressure change as the fluid moves along the tube if dissipative forces are present ?
(b) Do the dissipative forces become more important as the fluid velocity increases ? Discuss qualitatively.

20. Derive equation of continuity.

21. Obtain degrees of freedom for
(a) monoatomic,
(b) diatomic and
(d) triatomic molecules.

22. Answer the following questions based on the P-T phase diagram of $CO_2$ .
(i) At what temperature and pressure can the solid, liquid and vapour phases of $CO_2$ co-exist in equilibrium ?
(ii) What is the effect of decrease of pressure on the fusion and boiling point of $CO_2$ ?
(iii) What are the critical temperature and pressure for $CO_2$ ? What is their significance ?
(iv) Is $CO_2$ solid, liquid or gas at :
(a) – 70° C under 1 atm.
(b) – 60° C under 10 atm.
(c) 15°C under 56 atm.

23. A group of students went to a place on excursion. While boating on sea water, the students identified a submerged Torpedo shaped structure. The boys debated among themselves on what they saw. A student by name Sharath considering it as a threat informed the police. The police took necessary steps to protect the country from the enemy submarine. Sharath was rewarded.
(a) What can you say about the qualities exhibited by Sharath ?
(b) A SONAR system fixed in a submarine operates at a frequency 40 kHz. An enemy submarine moves towards the SONAR with a speed of 360 km/hr. What is the frequency of sound reflected by the submarine ? Take the speed of sound in water to be 1450 m/s. (V.B.Q.)

24. Derive the relations :
(i) $v^2 = u^2 + 2as$

(ii) $v = u + at$ (iii) $s = ut + 1/2\ at^2$.
**Or**
(a) In a car race, car A takes a time t less than car B and finishes the finishing point with a velocity v more than that of the car B. Assuming that the cars start from rest and travel with, show constant accelerations $a_1$ and $a_2$ respectively, show that $v = \sqrt{(a_1 . a_2)}$
(b) The displacement of a particle moving in one dimension under the action of a constant force is related to the time t by the equation $t = \sqrt{x} + 3$, where x is inmetre and t is in second. Find the displacement of the particle when its velocity is zero.

25. Prove the theorem of perpendicular axis.
**Or** Prove the theorem of parallel axis.

26. (a) Derive an expression to find specific heat with the help of calorimeter.
(b) Find the coefficient of thermal conductivity.
**Or**
(a) Find relation for temperature gradient.
(b) Show the expression for heat flow through the compound wall