

ICSE Board
Class IX Physics
Silver Series
Sample Paper – 3

Time: 2 hrs

Total Marks: 80

General Instructions:

1. Answers to this paper must be written on the paper provided separately.
2. You will **not** be allowed to write during the first **15** minutes.
This time is to be spent in reading the question paper.
3. The time given at the head of the paper is the time allotted for writing the answers.
4. Attempt **all** questions from **Section I** and **any four** questions from **Section II**.
5. The intended marks of questions or parts of questions are given in brackets [].

SECTION I (40 Marks)

Attempt all Questions from this Section

Question 1

- (a) Name four common units of time which are greater than a second but less than a year. [2]
- (b) What is the value of 100 dyne on a system based on meter, kilogram and second? [2]
- (c) How do weather changes affect atmospheric pressure? [2]
- (d) Draw a sketch of distance-time graph of a body moving with uniform speed when its initial displacement is (i) zero (ii) not zero. [2]
- (e) A railway locomotive with a mass of 80 tonnes accelerates at a rate of 2 m/s^2 . What force does the engine of the locomotive exert? [2]

Question 2

- (a) In what condition, does a spring exert force on the objects attached to its ends? [2]
- (b) Name two sources of carbon dioxide gas in the atmosphere. [2]
- (c) Why does a person fall off in the backward direction, from a stationary horse if the horse darts off suddenly? [2]
- (d) Why are metal scales/measuring tapes used for measuring length made of alloy? [2]
- (e) What temperature Fahrenheit is equivalent to: [2]
 - i. 0°C
 - ii. 100°C

Question 3

- (a) Distinguish between heating an object by doing work on it and by supplying heat to it. [2]
- (b) State the first law of thermodynamics. [2]
- (c) Light comes through a small keyhole. An inverted image of a building outside is seen through the door of your school's dark room on the opposite wall of the dark room. Explain why. [2]
- (d) An object is placed between two plane parallel mirrors. Why do its images get fainter and fainter? [2]
- (e) Why are concave mirrors used as shaving mirrors? [2]

Question 4

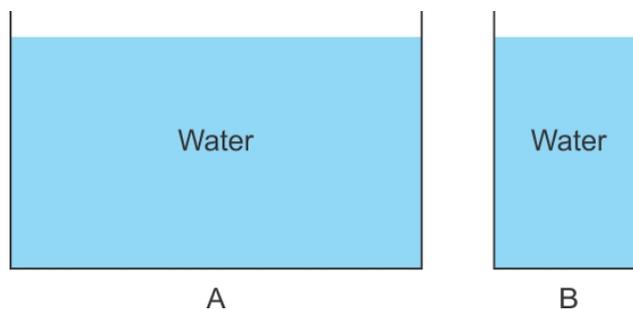
- (a) An observer moves towards a stationary plane mirror at a speed of 'v' m/s. With what speed, will his image move towards him? [2]
- (b) Why does sound travel faster on a cloudy day than on a dry day? [2]
- (c) Time period of the particles of a medium is 2×10^{-3} s and wavelength of corresponding wave is 3 m. Find the speed of the wave in the medium. [2]
- (d) A primary and a secondary cell are of the same e.m.f. From which one can we draw maximum current? [2]
- (e) Can you separate the two magnetic poles? [2]

SECTION II (40 Marks)

Attempt any four Questions from this Section

Question 5

- (a) A vernier scale has 10 divisions and on its main scale, 1 cm is divided into ten parts. The number of divisions on the left side of the zero of the vernier scale is 56 and the 8th vernier scale division coincides with the main scale. If the instrument has 0.09 cm of negative zero error, calculate the corrected length. [3]
- (b) Express the smallest possible value measured accurately using the following instruments: [3]
- Meter rule (in mm)
 - Vernier calipers (Least count 0.1 mm)
 - Screw gauge (Least count 0.001 cm)
 - Thermometer (0.1°C)
 - Protractor (in degrees)
 - Spring balance (Least count 5 g).
- (c) [4]
- What do you mean by a graph? Mention two necessary rules to plot a graph?
 - Two tanks A and B are filled with water to the same height as shown in the figure given below.



In which of the two tanks, will the pressure at the bottom be greater?

Question 6

- (a) A lift gets accelerated from rest to a speed of 72 km/h in $\frac{1}{12}$ minute. It then moves uniformly for the next 30 s before coming to rest at the topmost storey of the building in 8 s. [4]
- Draw velocity-time graph of the lift.
 - What is the acceleration of the lift?
 - What is the retardation of the lift?
 - What is the height of the building?
- (b) A body starts from rest and moves with constant acceleration 'a'. Show that its instantaneous velocity varies directly with the square root of the distance travelled. [3]

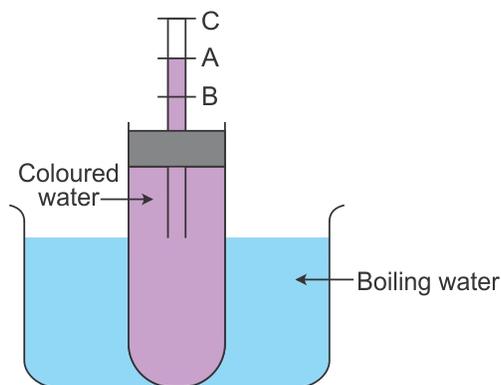
- (c) [3]
- A body has constant acceleration. During its motion, is it possible for the body to travel opposite to the direction of acceleration? Give an example.
 - Why does square of time occur in a unit of acceleration?

Question 7

- State Newton's law of gravitation. Distinguish between gravity and gravitation. [4]
- Why are girders supporting bridges mounted on rollers? [3]
- [3]
 - Is it correct to say that Newton's second law of motion is the real law of motion?
 - A mass of 5 kg is acted upon by a force of one Newton. Starting from rest, how much distance is covered by the mass in 20 s?

Question 8

- The area of a copper plate at 0°C is 3 m². Calculate the area of the plate when it is heated through 40°C. Take coefficient of linear expansion of copper = 0.000016 °C⁻¹. [3]
- Given figure shows a hard glass test tube containing coloured water such that the level of water is up to point A. The test tube is placed in a large beaker containing boiling hot water. It is observed that the level of coloured water first drops to B and then rises up to C. Answer the following questions. [4]



- Why is there a drop in the level of water?
 - Why does the level of water start rising after sometime?
 - State the two important deductions which can be made regarding the action of heat on liquids from the above observations.
 - If the test tube is placed in ice cold water instead of boiling hot water, state your observations with reasons.
- (c)
- Write the relation between coefficient of volume expansion and coefficient of linear expansion.
 - A metallic ball is heated through a certain temperature. Out of radius, surface area and volume, which will undergo the least percentage increase and which will undergo largest percentage increase? Why? [3]

Question 9

- (a) State three practical uses of ultrasonic vibrations. [3]
- (b) [3]
- i. A clock having marks instead of numbers on its dial appears to indicate 4:35 when viewed through a plane mirror. What is the correct time? Explain the anomaly.
 - ii. Draw a neat ray diagram to illustrate how a concave mirror is used as a shaving mirror.
- (c) Answer the following questions: [4]
- i. Which mirror has the highest radius of curvature?
 - ii. Which mirror (plane/spherical) has the least focal length?
 - iii. What is the relation between the mirror radius and its focal length?
 - iv. Why dish antennas are hemispherical in shape?

Question 10

- (a) A conductor is mounted on an insulating stand. A glass rod rubbed with silk is brought near the conductor (not touched). A proof plane is made to touch the surface of the conductor far from the rod and then, the proof plane is touched to the cap of a positively charged gold-leaf electroscope. What will be your observation? Give reason for it. [3]
- (b) Is dry cell really dry? Explain. [3]
- (c) [4]
- i. Two long needles are attached to the poles of a horse-shoe magnet. Show the positions occupied by the needles on a diagram and name the phenomenon which comes into play.
 - ii. State one way in which magnetism can be lost.