

ICSE Board
Class IX Physics
Paper – 2

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 [].
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SECTION I (40 Marks)

Attempt all Questions from this Section

Question 1

- (a) Enrico Fermi (Italian physicist) suggested that the length of one lecture period (50 min) is nearly equal to one micro-century. Verify it by converting micro-century into minutes. [2]
- (b) Why one cannot suck lemonade on the surface of the moon with a soda straw? [2]
- (c) State the use of graph in physics. [2]
- (d) A boy throws a ball vertically upwards. It rises to a height 'h' and then returns to the point from where it was thrown. What is the total distance moved by the ball? Also, find its displacement. [2]
- (e) On what factors does the time period of a simple pendulum depend? [2]

Question 2

- (a) A particle is moving with a uniform speed on a circular path. Will it be an accelerated motion? Why? [2]
- (b) Give one example of each of the following forces which
(i) Attract (ii) squeeze (iii) Stretch (iv) pull [2]
- (c) Give an example where two equal and opposite forces do not form an action-reaction pair. [2]
- (d) Why does the surface of a lake freeze first? [2]
- (e) Why is a body with large reflectivity a poor emitter? [2]

Question 3

- (a) Why are taps left dripping at sub-zero temperatures? [2]
- (b) Who is the super-consumer of resources? [2]
- (c) The mass of the moon is approximately 10% of the mass of the earth. What will be the gravitational force of the earth on the moon in comparison to the gravitational force of the moon on the earth? [2]
- (d) It is said that "virtual image cannot be caught on a screen." Yet, when we are seeing a virtual image, we are obviously bringing it onto the screen i.e. the retina of our eyes. Is the said statement wrong? [2]
- (e) What is the difference between the virtual images produced by [2]
 - i. plane mirror
 - ii. concave mirror
 - iii. convex mirror

Question 4

- (a) Draw a ray diagram of the periscope. [2]
- (b) A wave of wavelength 0.68 m has a time period of 0.002 sec. Find its velocity. [2]
- (c) A hunter fires a gun on a cliff. Sound of firing is heard 12.5 s after seeing the smoke by an observer 4 km away from the cliff. Calculate the speed of sound in the air. [2]
- (d) Why is it easier to start a car engine on a warm day than on a chilly day? [2]
- (e) A small magnet is suspended through a silk thread from a rigid support such that the magnet can freely swing. How will it rest? [2]

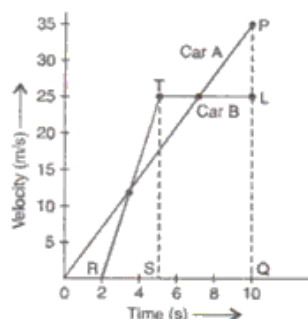
SECTION II (40 Marks)
Attempt *any four* Questions from this Section

Question 5

- (a) What is the function of ratchet in a screw gauge? A screw gauge has positive error of 7 divisions such that its main scale is marked in half mm and circular scale has 100 divisions. The spindle of the screw advances by 1 division on one complete revolution. If the screw gauge reading is 9 divisions on the main scale and 67 divisions on the circular scale for the diameter of a wire, calculate [4]
- Pitch
 - Least count and
 - Corrected diameter.
- (b) A girl standing on an oscillating swing sits down. How does the time period of a swing get affected? What happens to its frequency of oscillation? [3]
- (c) Define the term volume. Mass of a sphere of radius 1.4 m is 500 kg. Calculate the density of the material of the sphere. [3]

Question 6

- (a) Given figure shows a velocity-time graph for two cars A and B starting from the same point in the same direction. [4]



Calculate the following:

- Acceleration of car A.
 - Acceleration of car B between 2s - 5 s.
 - At what time intervals, both cars have same velocity?
 - Which car is ahead after 10 s and how much?
- (b) Derive the first equation of motion. [3]
- (c) A stone dropped from the top of a cliff reaches ground level in 4 s and buries itself 0.8 m into the mud. Calculate, [3]
- height of cliff
 - final velocity of stone on reaching level and
 - retardation produced by the mud. Take $g = 9.8 \text{ m/s}^2$.

Question 7

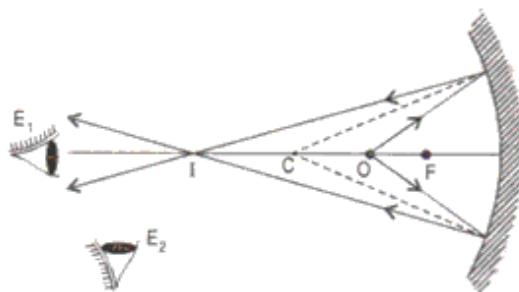
- (a) It is experienced that in our daily life Newton's first law is contradicted.
Comment. [3]
- (b) Sound takes 3 s to reach a certain distance from the source placed in air. How much time will it take to reach the same distance when the source is in water?
Take speed of sound in air as 330 m/s and in water as 1650 m/s. [3]
- (c) Define coefficient of linear expansion. Give its SI unit. State the factors on which the thermal expansion of a solid depends. [4]

Question 8

- (a) Describe an experiment to demonstrate thermal expansion in gases. [4]
- (b) The mercury falls by $\frac{8}{15}$ parts between two standard points on a Celsius thermometer; when the boiling water at 100°C is allowed to cool to room temperature. Calculate room temperature in [3]
(i) Celsius scale (ii) Fahrenheit scale.
- (c) [3]
- What is the difference in the wavelength of infrared rays emitted from the sun and that radiated from the earth?
 - How is the size of a degree defined on the Celsius scale and on the Fahrenheit scale?

Question 9

- (a) Given figure shows the image I of a point object O. How will you differentiate between point object and its image? [3]



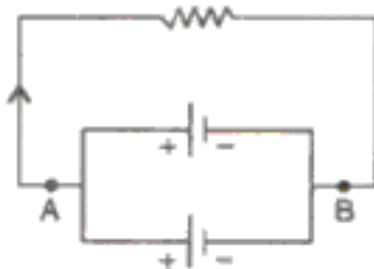
- (b) Give three applications of plane mirrors. [3]
- (c) [4]
- Distinguish between light wave and sound wave. Give at least three points.
 - Arrange the speed of sound in gases, solids and liquids in ascending order.

Question 10

- (a) A glass rod is rubbed with a silk cap. Describe the observations when [4]
- The rod is brought near the cap of a neutral gold leaf electroscope and then, it is removed without touching the cap.
 - Keeping the glass rod near the cap of the neutral electroscope; the cap is touched with the finger momentarily while the rod is near it. The rod is then removed.
 - The cap is touched with the rod and the rod is then removed.

Explain each observation on the basis of the movement of free electrons.

- (b) In the given circuit diagram two cells are connected in parallel. Answer the following: [3]



- What is the potential difference between points A and B if e.m.f. of each cell is 1.5 V?
 - How does the effective voltage of the two cells connected in series compare to their arrangement in parallel?
 - Are the cells in a conventional flash light connected in series or in parallel?
- (c) You are given following three bars exactly similar in size and shape: [3]
- A permanent magnet
 - A bar of soft iron
 - A bar of non-magnetic substance.

Describe how you will identify each of the bars if only a piece of thread is supplied to you as the extra piece of apparatus.