ICSE Board
Class IX Physics
Paper – 1

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) Express one day in milliseconds.   [2]

(b) Why are the passengers' cabins in an aeroplane pressurized?   [2]

(c) What does a straight line graph signify?   [2]

(d) Following table gives the distance travelled by a particle at different times.

Time (s)	0	0.25	0.5	0.75	1	1.25	1.5
Distance (cm)	0	2	5	9	16	25	36

Draw a distance-time graph representing the motion of the particle.   [2]

(e) What will be the magnitude and direction of the reaction force acting on a coin of 10 g lying on the surface of the floor? Take g = 9.8 m/s^2 [2]

Question 2

(a) Distinguish between fundamental units and derived units.   [2]

(b) The earth attracts an apple. Does the apple also attract the earth? If it does, why does the earth not move towards the apple?   [2]

(c) An empty truck and a loaded truck are moving with the same velocity. On applying brakes, which truck will stop first and why?   [2]

(d) In cold countries, ponds freeze only at the surface. Why?   [2]

(e) Why do we wear woolen clothes in winter?   [2]

Question 3

(a) Draw a graph of volume and temperature when 5 cm³ of ice at - 10°C is heated to form water at 10°C. [2]

(b) A brass disc is fitted strongly in a hole in a steel plate. What will you do (heat or cool) with the system to loosen the brass disc from the hole? $\left(\alpha_{steel} < \alpha_{brass}\right)$ [2]

(c) Which mirror forms the image of a wider region? Also, give relevant figure. [2]

(d) You have learnt that plane and convex mirrors produce virtual images of the objects. Can we get real images under some circumstances? How? [2]

(e) Does the size of the mirror affect the nature of the image? [2]

Question 4

(a) Which properties are common in all types of mechanical waves? [2]

(b) Two point objects, P and Q are situated in front of a plane mirror at distances of 15 cm and 30 cm respectively on the same straight line. Calculate the distance between the object P and the image of Q. [2]

(c) Select the waves of the frequencies which will not be audible to human beings: 15 Hz, 250 Hz, 100 Hz, 30000 Hz. [2]

(d) How will you obtain (i) small resistance and (ii) large resistance from a few given resistances? [2]

(e) How will you test whether a given rod is made of iron or copper? [2]

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

Question 5

(a) Given diagram shows a screw gauge. In one measurement, the final position of the scale is as shown in the diagram. The circular scale has 50 divisions.   [3]
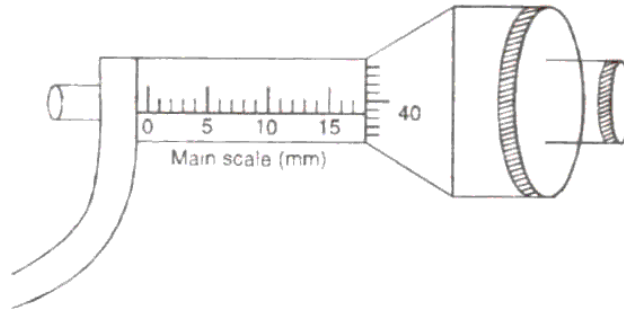
Main scale (mm)

    i.   What is the least count of the screw gauge?
    ii. If 40th division of the circular scale coincides with the main scale line, what is the final reading?
    iii. What do you mean by back-lash error of a screw gauge?

(b) In a physical balance,   [3]
    i.   State the principle on which it works.
    ii. What is measured by physical balance?
    iii. What is the role of a plumb line?
    iv. What is the role of base screws?
    v.   State two requirements for a good balance.

(c) A weather forecasting plastic balloon of volume 15 m³ contains hydrogen of   [4]
    density 0.09 kg/m³. The volume of equipment carried by the balloon is negligible compared to its own volume. The mass of the empty balloon alone is 7.15 kg. The balloon is floating in the air of density 1.3 kg/m³. Calculate:
    i.   Mass of hydrogen in the balloon.
    ii. Mass of hydrogen and balloon.
    iii. If mass of equipment is x kg, write down the total mass of hydrogen, the balloon and the equipment.
    iv. Mass of air displaced by balloon.
    v.   Using law of floatation, calculate the mass of equipment.

Question 6

(a) An electron moving with the speed of 5×10^4 m/s enters into an electric field and attains a uniform acceleration of 10^{15} m/s^2 in the direction of motion. In how much time, will it attain a speed twice of its initial speed? In this time, how much distance will it cover? [3]

(b) [4]

i. Explain with the help of an example whether the velocity or the acceleration of a body give the direction of motion.

ii. In the given figure, velocity-time graph of a body moving in a straight line is shown. Find the displacement and the distance travelled by the body in 6 s.
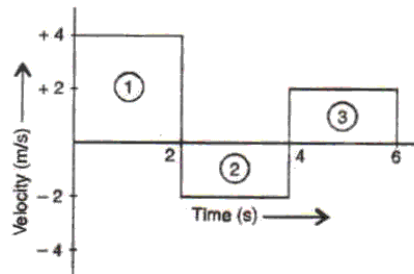
(c) A body is projected vertically upwards with a velocity of 98 m/s. Find (i) the maximum height attained by the body and (ii) time taken by body to reach the highest point. Take g = 9.8 m/s^2 [3]

Question 7

(a) [4]

i. State Newton's third law of motion.

ii. John pushes a wall with a force of 20 N towards the east, what force will be exerted by the wall on John?

iii. In the following figure, a block of weight 10 N is hanging from a rigid support by a thread. Find:

1. The force exerted by block on the thread.
2. The force exerted by the thread on the block.

(b) Mention three disadvantages of construction of large dams for generating hydroelectric power. [3]

(c) A 3 kg stone is weighed first with a physical balance and then by a spring balance at the pole and at the equator. Where will the weight be maximum? [3]

Question 8

  (a) Explain the effect of ozone depletion. [3]

  (b) [4]
     i.   What is the use of thermos flask?
     ii. Draw a labeled diagram of thermos flask.
     iii. What contribution does the vacuum between the two walls give to the functioning of a thermos flask?
     iv. What is the function of the two shining walls of the glass vessel in the thermos flask?

  (c) A test tube made of ordinary glass cracks on plunging into boiling water whereas a red hot test tube made of fused silica can be safely plunged into normal water, why? [3]

Question 9

  (a) [4]
     i. Select the luminous objects from the following:
       Candle flame, stars, moon, red hot wire of heater, polished surface, and firefly.
     i. In a room, the light is not reaching directly, even then it is illuminated. Why?
     ii. What will be the colour of the sky for space travellers?

  (b) In what way, a point source should be placed in front of a concave mirror to get the parallel beam and the divergent beam. [3]

  (c) Compare the frequencies of two waves X and Y while velocity and wavelength of X are 5×10^3 m/s and 25 m respectively and for Y, 4×10^3 m/s and 20 m respectively. [3]

Question 10

  (a) A and B are two negatively charged and insulated conductors as shown in the figure. State, with reason, which conductor will tend to lose charge. [3]
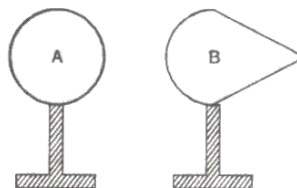
  (b) Draw a labelled diagram of Leclanche cell. Why is it not suitable for continuous use? [3]

  (c) [4]
     i. What is the general law of attraction and repulsion between magnetic poles?
     ii. What defines the direction of the magnetic field?
     iii. The middle region of a bar magnet is:
        1. A north pole
        2. A north seeking pole
        3. Unmagnetized
        4. Magnetized
     iv. Name two magnetic substances.   5