ICSE Board Class IX Physics Paper – 5

Time: 2 hrs

Total Marks: 80

[2]

[2]

[2]

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) Define light year and astronomical unit.
- (b) Give the order of magnitude of the following:
 - i. 0.0002303
 - ii. 0.3740 g/cm^3
 - iii. 6.230 J
 - iv. 7.14×10^{14} kg.
- (c) A block of mass 7 kg and volume 0.07 m³ floats in a liquid of density 140 kg m⁻³.
 Calculate the volume of the block above the surface of the liquid. [2]
- (d) A person moves 10 m towards the east and then 10 m towards the north. What is the displacement?
 [2]
- (e) Write any two effects of force applied to a non-rigid body.

Question 2

- (a) Given an example of motion in which speed remains the same but velocity changes.
- [2] (b) In an instrument, there are 25 divisions on the vernier scale which coincide with 24 divisions of the main scale. 1 cm on the main scale is divided in 20 equal parts. Find the least count. [2]
- (c) A girl is in rest state with a book of 0.6 kg on her palm.
 - Find the following:
 - i. The force exerted by Earth on the book
 - ii. The force exerted by book on the Earth
 - iii. Under what forces, the book is in equilibrium?

Take g = 9.8 N/kg.

[2]

(d) An iron cork is fitted in a hole on the brass plate. What will be happen to the cork if

[2]

[2]

- i. only the cork is heated?
- ii. only the iron plate is heated?
- iii. both, the cork and the plate are heated equally?
- (e) Why are stainless steel cooking pans preferred with extra copper bottoms?

Question 3

(a) In the given figure, a bimetallic strip is used in a simple fire alarm.



Name suitable materials for X and Y. What adjustments would you make to the arrangement shown to make the alarm operative at a lower temperature and why?

- [2] (b) What are nutritive elements? [2] (c) A pyrex glass dish does not crack when heated strongly while an ordinary glass dish
- does crack. Explain why? [2]
- (d) Which type of mirror is preferred in automobiles to observe traffic at the back? [2]
- (e) In case of a convex mirror, if the object is moved away from the mirror surface, how does the position of the image change? [2]

Question 4

- (a) Mention the essential conditions required for sound waves to travel in a medium. [2]
- (b) Why we cannot hear the explosions that take place on other planets on the Earth? [2]
- (c) In 0.4 m, there are 20 waves and an observer's ear perceives 120 waves in a minute.Calculate the wavelength, the frequency and the speed of the wave. [2]
- (d) What is the difference between a voltmeter and a voltameter? [2]
- (e) Name the magnetic elements at a place on the surface of the Earth that completely specify the earth's magnetic field at that point. [2]

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

Question 5

- (a) State four important characteristics of gravitational force. [4] (b) A pendulum of length 1 m has a time period of 2 s. Calculate the time period if its length is changed to half metre. [3]
- (c) Focal length of a convex lens recorded by three students are 10.1 cm, 10.2 cm and 10.0 cm. Find the mean focal length of the convex lens. [3]

Ouestion 6

(a) A body is thrown vertically upwards with a velocity 'u'. Calculate the:

- i. maximum height attained by the body.
- ii. time of ascent.
- iii. time of descent.
- iv. speed of the body on reaching the ground. [4]

[3]

- (b) What are the uses of velocity-time graph?
- (c) A rocket fired vertically upwards, has its fuel exhausted in 10 s. Calculate the height attained by the rocket from its velocity-time graph given below: [3]



Question 7

(a) The graph shows the velocity-time graph for two bodies X and Y moving in the same direction. Name the body which has greater acceleration. Why? [3]



- (b) A metal bar measures 50 cm at 0°C and 50.048 cm at 353 K. Find the coefficient of linear expansion of the metal. [3] [4]
- (c) Define inertia and its types.

Question 8

(a) Mention a few consequences accompanied with the transfer of heat.	[3]
(b) "Aquatic animals can survive below the surface of frozen rivers". Explain.	[3]

(c) What is sea breeze? Explain its causes of origin and direction of motion? [4]

Question 9

- (a) Suppose a planet exists where mass and radius both are half those of the Earth. Calculate the acceleration due to gravity on the surface of this planet. Given: $g_E = 9.8$ ms⁻² [3]
- (b) Two plane mirrors are inclined to each other at an angle of 70°. A ray of light is incident on one mirror at an angle θ . The ray reflected from this mirror falls on the second mirror from where it is reflected parallel to the first mirror. Determine the value of θ . [3]
- (c)
- i. Complete the ray diagram.



ii. Ratio of the wavelengths of two sound waves in air is 3:5. Find the ratio of their frequencies. [4]

Question 10

- (a) An ebonite rod is rubbed with fur. The fur is brought near to a positively charged gold-leaf electroscope. What will be your observations? Give reasons.[3]
- (b) You are given conducting wires, a cell, a key, a resistor, two different types of meters labeled 'A' and 'V'. You are required to measure the current in the wire and the potential difference across the resistor. Draw a labeled circuit diagram using appropriate symbols to show how they are connected. Also, mark the direction of current in each component. [3]
- (c) A horse-shoe magnet, when not in use, is kept with a metal piece 'A' that is held to the north and south poles. [4]



- i. What is the metal piece 'A' called?
- ii. What is 'A' made of?
- iii. What is the function of piece A?
- iv. Explain how the piece 'A' serves the purpose, on the basis of molecular (or domain) theory of magnetism.