

FINAL EXAMINATION: 2024-25

CLASS: IX

SUBJECT: PHYSICS

NAME OF STUDENT:

MAX. MARKS: 80

DATE:

TIME: 2 HOURS

NOTE: - You will not be allowed to write during the first 15 minutes. This time is to be spent in reading the question paper. The time given at the head of this paper is the time allowed for writing the answers.

Section A is compulsory. Attempt any four questions from Section B. The intended marks for questions or parts of questions are given in brackets []

All subparts of the question attempted must be answered in the correct serial order.

SECTION A

Attempt all the questions from this Section

Question 1

[1 x 15]

(i) If relative density of a solid object is 30.2. So, the density of this object is:

- (a) 30.2 g cm^{-3} . (b) 3020 kg m^{-3} .
(c) 15.1 g cm^{-3} . (d) 1510 kg m^{-3} .

(ii) From the values given below, a human being can hear the sound having a frequency of:

- (a) 15Hz. (b) 15000Hz.
(c) 30000Hz. (d) 5Hz.

(iii) Pascal's law applies to which of the following?

- (a) Gases only. (b) Liquids only.
(c) Both gases and liquids. (d) Neither gases nor liquids.

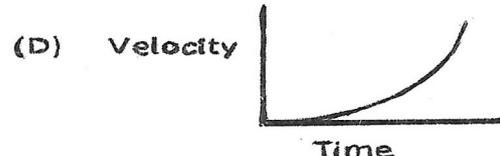
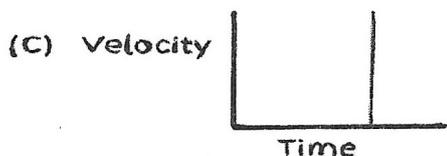
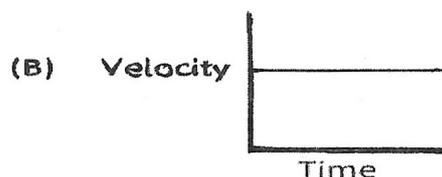
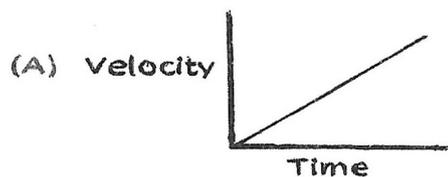
(iv) A body moving with a constant speed along a circular path has:

- (a) Zero acceleration. (b) Variable acceleration.
(c) Constant acceleration. (d) Constant velocity.

(v) Where can we place the object to obtain a virtual and erect image in case of concave mirror?

- (a) Beyond centre of curvature. (b) At focus.
(c) Both (a) and (b). (d) Between focus and pole.

(vi) Which of the following graphs correctly represents the motion of a car starting from rest and accelerating uniformly?



(vii) The value of 'g' varies with:

- (a) Altitude and depth. (b) Mass of the object.
(c) Temperature. (d) Speed of the object.

(viii) What is the term for the smallest division on a measuring instrument?

- (a) Zero error. (b) Least count.
(c) Calibration. (d) Range.

(ix) A current 0.5A flows in a wire of resistance 20Ω . The potential difference across the end of the wire will be:

- (a) 40 V. (b) 10 V.
(c) 100 V. (d) 0.025 V.

(x) Which of the following statements is true regarding magnetic field lines?

- (a) They can intersect each other. (b) They are straight lines only.
(c) They form closed loops. (d) They start from the south pole and end at the north pole.

(xi) Which of the following is NOT a unit of force?

- (a) newton. (b) dyne.
(c) joule. (d) kgf.

(xii) When an object of density ρ_s is placed in water of density ρ_w , it gets completely submerged and floats by displacing 50N of water. What does this indicate? (F_B = Buoyant force of water)

- (a) $\rho_s = \rho_w$. (b) $F_B = 50N$.
(c) $F_B < 50N$. (d) Both (a) and (b).

(xiii) The resistance of a wire is inversely proportional to its:

- (a) Length. (b) Cross-sectional area.
(c) Temperature. (d) Both (a) and (c).

(xiv) The law of conservation of energy states that:

- (a) Energy can be created and destroyed.
(b) All forms of energy are interchangeable.
(c) Energy is only conserved in mechanical systems.
(d) Energy cannot be created or destroyed; it can only be transformed.

(xv) **Assertion (A):** The speed of sound is greater in gases than in solids.

Reason (R): Solids are more elastic than gases.

- (a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, but R is not the correct explanation of A.
(c) A is true, but R is false.
(d) A is false, but R is true.

Question 2

I. Complete the following by choosing the correct answers from the bracket: -

[6]

(i) The temporary magnetism acquired by a magnetic material when it is kept near or in contact with a magnet, is called _____ (magnetic strength, magnetic field, induced magnetism).

(ii) Each ship has a white line painted on its side which indicates the safe limit for loading the ship in water of density $1g/cm^3$. This line is known as _____ (white safety line, pinhole line, plimsoll line).

(iii) A device by which resistance in a circuit can be varied continuously is known as _____ (ammeter, rheostat, voltmeter).

(iv) If the image is upright, magnified and increases in size on small movement of the mirror away from the face, the mirror is _____ (concave, convex, plane).

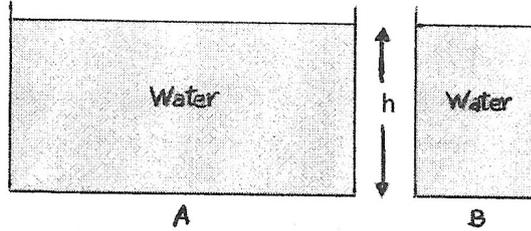
(v) If the length of a simple pendulum is made one-fourth. Its time period becomes _____ (one-fourth, half, double).

(vi) In a same medium, the speed of ultrasonic wave is _____ to that of infrasonic wave. (more, equal, less).

- II. A clock having marks instead of numbers on its dial appears to indicate 4:35 when viewed through a plane mirror. Is it the correct time? If not, then draw the clock showing actual time. Name the phenomenon responsible for this incorrect time display. [2]
- III. When you jump to the shore from a stationary boat, the boat moves in the opposite direction. Does it demonstrate any Newton's laws of motion? If yes, state which? [2]

Question 3

- (i) Why can we hear sound more clearly in humid season than in dry season? [2]
- (ii) What will be the polarity at the ends of the halves created by breaking a bar magnet? What does it conclude? [2]
- (iii) A person moves 3 m towards the east and then 4 m towards the north. Find the distance and displacement covered by him. [2]
- (iv) Two tanks A and B are filled with water of same density to the same height as shown in the figure given below. Using the formula of fluid pressure, find the ratio of the pressure exerted by water at the bottom of these two tanks. [2]



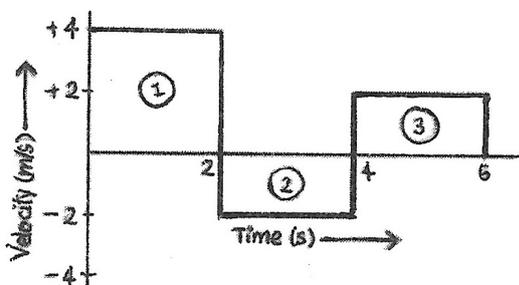
- (v) What will be the gravitational force of attraction between two bodies, each of mass 1 kg, kept at a separation of 1m? [2]
- (vi) A test chart of an optician is situated 1.5 m behind the eyes of a patient who is looking through a plane mirror 2 m away from him. What is the distance between him and the image of the test chart? [2]
- (vii) State the use of: - [3]
- (a) Ammeter
 - (b) Voltmeter
 - (c) Galvanometer

SECTION B

Attempt any four questions

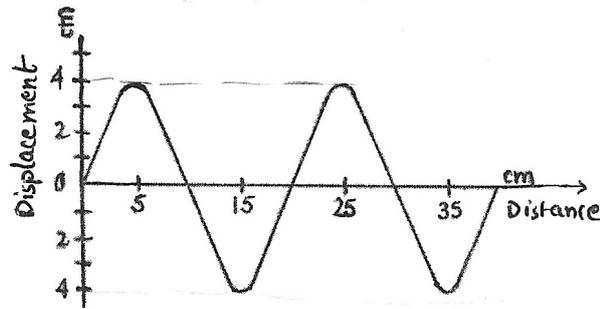
Question 4

- (i) What are neutral points? In which direction will compass needle rest when placed at the neutral point? [3]
- (ii) (a) State the principle of floatation. [3]
 (b) A block of wood floats in brine solution of density 1.15 g cm^{-3} such that three-fifth of its volume is immersed into the brine. Calculate the density of wood.
- (iii) 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. [4]



Question 5

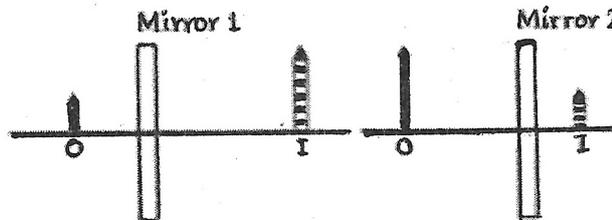
- (i) Given below is the snapshot of a wave form of frequency 40 Hz. For this wave, find: - [3]



- (a) time period,
 (b) wave velocity,
 (c) amplitude.

- (ii) (a) How much is 1 atm in Pa? [3]
 (b) How are we able to drink beverages using straw on earth. Why can't we do the same in space?

- (iii) Consider the figure given below and answer the following:- [4]

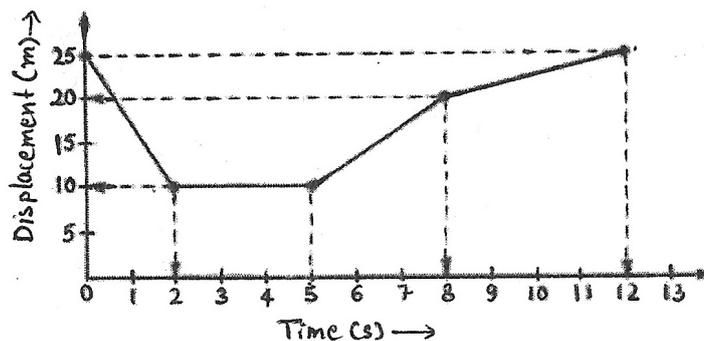


- (a) Identify Mirror 1 and Mirror 2.
 (b) Draw ray diagram to show the image formation in each case.

Question 6

- (i) Write the derived unit of quantities given below in terms of fundamental units: - [3]
 (a) Pressure
 (b) Force
 (c) Charge

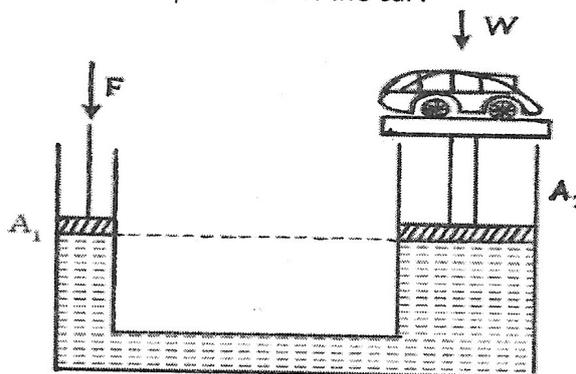
- (ii) Given below is the displacement- time graph of an object, find: - [3]
 (a) the time interval in which the object was at rest.
 (b) total displacement of the object.
 (c) average velocity between 5 s – 12 s.



- (iii) (a) What is an electromagnet? How can you identify the polarity at the ends of an electromagnet? [4]
 (b) State two ways through which the strength of an electromagnet can be increased.

Question 7

- (i) In a hydraulic jack as shown, mass of the car is 800 kg, $A_1 = 10 \text{ cm}^2$, $A_2 = 10 \text{ m}^2$. [3]
(A_1 and A_2 are area of cross-section of piston respectively)
(a) On what principle does this machine works?
(b) What will be the minimum force required to lift the car?



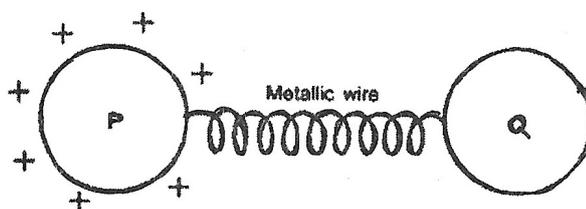
- (ii) What do you mean by inertia? Give one example each of the inertia of rest and the inertia of motion. [3]
- (iii) (a) Name the instrument used to measure atmospheric pressure. [4]
(b) State two factors which affect the atmospheric pressure as we go up.
(c) Draw an approximate graph to show the variation of atmospheric pressure with altitude.

Question 8

- (i) State any three properties of magnetic field lines. [3]
- (ii) What is potential difference? Find potential difference across the wire if 200 J of work is done in moving 2 C of charge. [3]
- (iii) A solid cylinder with a radius of 7 cm and a height of 10 cm is placed in water. The density of the cylinder is 2.5 g/cm^3 , and the density of liquid is 1.5 g/cm^3 . Answer the following questions: - (Take $\pi = 22/7$) [4]
(a) Will the cylinder float or sink?
(b) What will be the volume of the displaced liquid?
(c) What will be the buoyant force exerted by the liquid on the cylinder?
(d) What will be the maximum buoyant force that the liquid can exert on the cylinder?

Question 9

- (i) With the help of diagrams, explain the difference between regular and irregular reflection. [3]
- (ii) Two identical conductors P and Q are joined by a metallic wire, where conductor P is positively charged and conductor Q is uncharged. Will there be any flow of charges? If yes, then what will be the direction of the flow of charges and current? When will this flow stop? [3]



- (iii) (a) How is a solar power plant system different from a solar cell system? [4]
(b) Write one advantage and one disadvantage of using solar panels.

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