

HALF YEARLY EXAMINATION : 2025 - 2026

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 []

SECTION A

(Attempt all the questions from this Section)

Question 1

Choose the correct option. Do not copy the questions, write the answers only. [1 x 15]

(i) What will be the approximate weight of a body on the Moon if it weighs 48N on the Earth?

- (a) 48 N
- (b) 28 N
- (c) 8 N
- (d) 6 N

(ii) What will be the angle of reflection if the light fall normally on a reflecting surface?

- (a) 180°
- (b) -180°
- (c) 90°
- (d) 0°

(iii) Which of the following is a scalar quantity ?

- (a) Mass
- (b) Weight
- (c) Force
- (d) Acceleration

(iv) Pure water at 4°C has

- (a) maximum density, minimum volume
- (b) minimum density, minimum volume
- (c) maximum density, maximum volume
- (d) minimum density, maximum volume

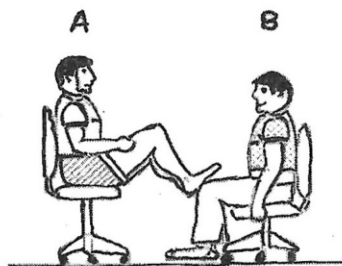
(v) Which of the following relation is incorrect ?

- (a) $1 \text{ kgf} = 9.8 \text{ N}$
- (b) $1 \text{ kgf} = 1000 \text{ gf}$
- (c) $1 \text{ gf} = 980 \text{ dyn}$
- (d) None of these

(vi) The time period of a simple pendulum of frequency 20 Hz is:

- (a) 0.05 s
- (b) 0.02 s
- (c) 0.002 s
- (d) 0.5 s

(vii) Student A and student B sit in identical office chairs facing each other, as shown in figure. Student A is heavier than student B. If student A suddenly pushes student B with his feet. Which of the following occurs?



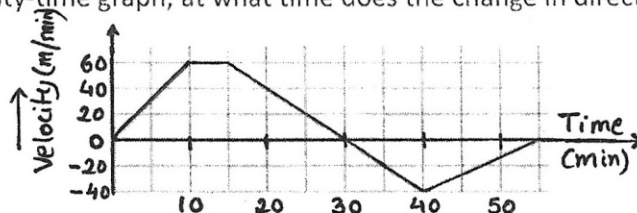
- (a) Neither student experiences force on each other.
- (b) A exerts a force that is applied to B but A experiences no force.
- (c) Each student applies a force to the other, but B experiences larger force.
- (d) Each student experiences the same amount of force on each other.

(viii) Upto how many decimal places can a common vernier callipers measure the length in cm?

- (a) 2
- (b) 3
- (c) 4
- (d) 5



- (ix) A ball placed on a table starts rolling down when the table is tilted. This is an example of:
- (a) contact force (b) non-contact force
(c) both (a) and (b) (d) None of these
- (x) In case of a convex mirror, the image formed is always:
- (a) upright (b) diminished
(c) virtual (d) All of these
- (xi) In the given velocity-time graph, at what time does the change in direction of motion occur?



- (a) 30 min (b) 15 min
(c) 40 min (d) 10 min
- (xii) The formula that can be used to calculate average velocity in case of uniform acceleration is:
- (a) $v_{avg} = \frac{v+u}{2}$ (b) $v_{avg} = \frac{v-u}{2}$
(c) $v_{avg} = v + u$ (d) $v_{avg} = v - u$
- (xiii) For precise measurement Least Count of an instrument should be:
- (a) as small as possible. (b) as large as possible.
(c) It has no relation with the measurement. (d) 1.
- (xiv) Which of the following is a derived unit?
- (a) litre (b) metre
(c) kilogram (d) none of these
- (xv) Assertion (A) : Displacement of an object will not be zero when distance travelled by it is not zero.
Reason (R) : The displacement is the shortest distance between initial and final positions of an object
- (a) Both (A) and (R) are true and (R) is correct explanation of (A).
(b) Both (A) and (R) are true and (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

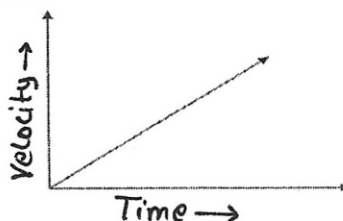
I. Complete the following by choosing the correct answers from the bracket :-

[6]

- (i) In case of concave mirror the minimum distance between the object and its real image is equal to _____ (zero, focal length, radius of curvature).
- (ii) The magnitude of non-contact force of attraction between two bodies kept at a distance X is inversely proportional to _____ (X^3 , X, X^2).
- (iii) _____ (Outside jaws, Inside jaws, Strip) of vernier callipers is used to measure the depth of a bottle.
- (iv) _____ (Area, Slope, Volume) of displacement- time graph represents velocity.
- (v) When ice melts, its temperature _____ (increases, decreases, remains constant).
- (vi) If the speed of sound in air at 0°C is 330 m/s, then its speed at 10°C will be _____ (360 m/s, 320 m/s, 336 m/s).

II. Draw the displacement- time and acceleration-time graph showing variation for the motion represented by the graph given below

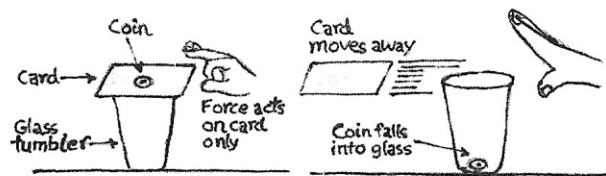
[2]



- III. During athletics meet, a high jumping athlete is provided either a cushion or a heap of sand to fall upon. Why? [2]

Question 3

- The mass of a truck at rest is 1 quintal. Find the force exerted by it on the road in SI units. (Take $g = 10 \text{ m/s}^2$) [2]
- Determine the ratio of the time periods of two simple pendulums, A and B, with bobs of masses 75 g and 125 g, respectively, given that they have the same effective length. [2]
- Write two differences between real and virtual images. [2]
- Boiling water is used to dip a centigrade and a Fahrenheit thermometer. The temperature of the water is reduced until the thermometer reads 140°F . What is the temperature according to the centigrade thermometer? [2]
- Write the relation between g and G . Also state the S.I. unit of G ? [2]
- The speed of sound in a gas remains same for all frequencies and wavelengths. What are the other two factors on which the speed of sound does not depend in gas? [2]
- A teacher was demonstrating an experiment in his class with the setup as shown in the figure below. [3]



A five-rupee coin is set on a stiff card covering an empty glass tumbler standing on a table. He then flicks the card hard with his fingers and the coin falls into the glass.

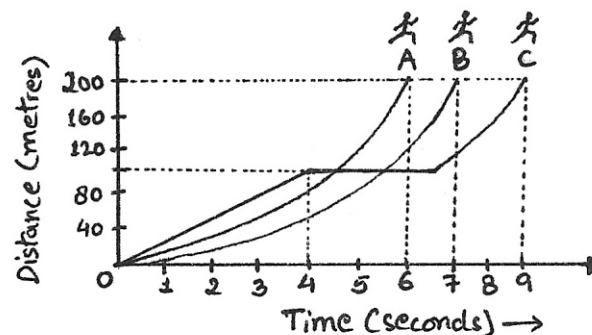
- State the law involved in this case.
- Which property does the coin possess?

SECTION B

(Attempt any four questions)

Question 4

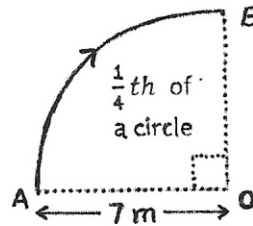
- Two bodies A and B of the same mass are moving with velocities $2v$ and $3v$ respectively. Compare their :- [3]
 - momentum
 - force needed to stop them in same time.
- A car starting from rest reaches a speed of 20 m/s in 10 seconds. What is its acceleration and the distance it travels in this time? [3]
- Study the distance-time graph given below and answer the following questions :- [4]



- Which runner won the race?
- Which runner stopped for a rest?
- Calculate the average speed of runner B.

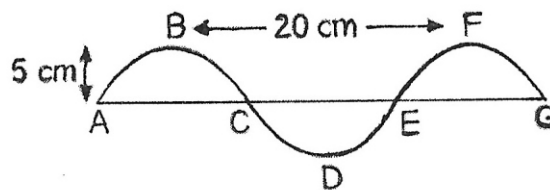
Question 5

- (i) Draw the graph showing the variation of :- [3]
- force with mass
 - acceleration with mass
 - force with acceleration.
- (ii) Write the expression of time period of a simple pendulum in terms of l and g . Also state any two factors on which the time period of the pendulum does not depend. [3]
- (iii) A body moves along a path AB as shown in the figure given below, where BOC is a quadrant of radius 7m. Calculate its :- [4]
- distance
 - displacement
- (take $\pi = 22/7$)



Question 6

- (i) Waves of frequency 100 Hz are produced in a string as shown in figure. [3]

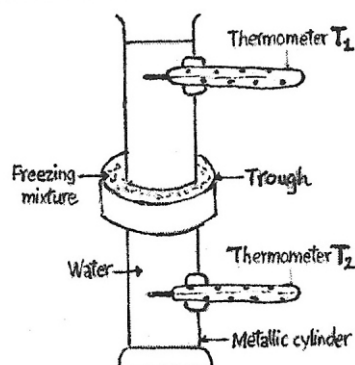


For the wave given above. Find:-

- the amplitude.
 - the wave velocity.
- (ii) Write three characteristics of a medium required for the propagation of a sound wave. [3]
- (iii) Shefali's brother, Anuj, plays music on the guitar for her on her birthday. [4]
- Based on vibration of particles and propagation of waves, answer the following questions:-
- What type of waves help Shefali to hear the music?
 - What type of waves are produced in the guitar string?
 - Give two differences between these types of waves.

Question 7

- (i) Draw the graphs to show the variation in temperature with time recorded by the thermometers T_1 and T_2 in the given Hope's experimental setup. What property of water does Hope's experiment demonstrate? [3]



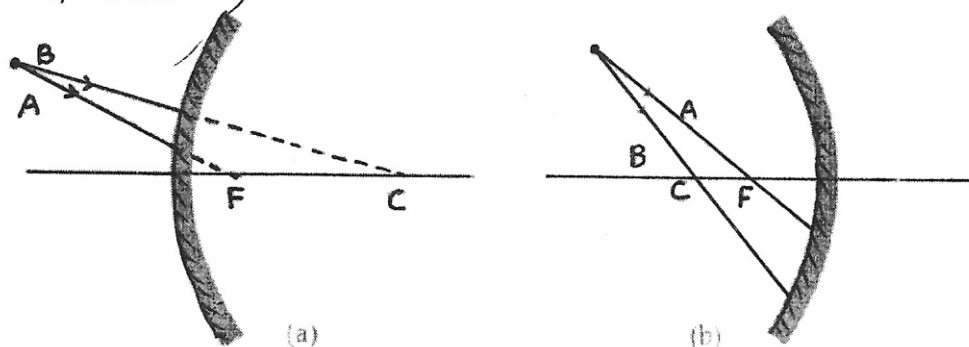
(ii) Name the sounds of the frequencies given below:-

- (a) 10Hz
- (b) 200Hz
- (c) 50kHz

[3]

(iii) Copy and complete the following ray diagram by drawing the reflected ray for each of the incident ray A and B.

[4]



Question 8

(i) Write the three equations of motion for a freely falling body, using the standard symbols for the quantities involved.

[3]

(ii) Name the physical quantities which are measured in the following units:-

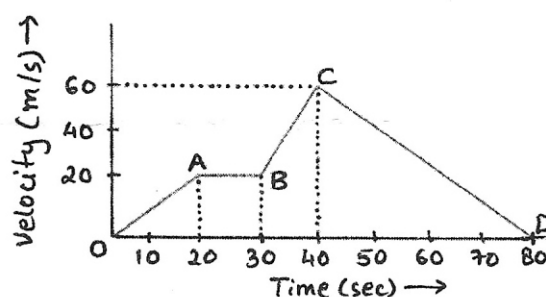
[3]

- (a) ly
- (b) shake
- (c) a.m.u.

(iii) The figure below shows the velocity-time graph of a body.

[4]

Study the graph and answer the following questions:-



(a) How much is the total displacement of the body from 30 s to 80 s ?

(b) Which portion of the graph represents maximum acceleration and how much is it?

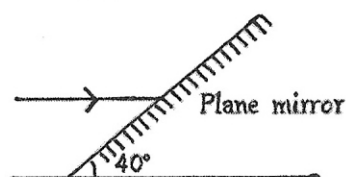
Question 9

(i) Write three characteristics of a plane mirror.

[3]

(ii) A plane mirror is inclined at 40° to floor, as shown in the figure given below. An incident ray parallel to the floor strikes the mirror. Write the two laws of reflection and, with their help, also find the angle of reflection in this case.

[3]



(iii) (a) Ravi wants to fix the rear-view mirror of his scooter. Which type of mirror should he use?

(b) The magnification of the real image of an object placed at 10 cm in front of a concave mirror is 3, at what distance is the image located? Also, find the focal length of the mirror.

[4]