HALF YEARLY EXAMINATION : 2024-25

CLASS - IX (ICSE)

PHYSICS (SCIENCE PAPER - 1)

Time: 2 hrs. M.M.: 80

Note : i) **Answer to this paper must be written on the paper provided separately.**
ii) **You will not be allowed to write during first 15 minutes.**
iii) **This time is to be spent in reading the questions paper.**
iii) **The time given at the head of questions paper is the time allowed for writing the answers.**
iv) **Section-A is compulsory. Attempt ANY FOUR questions from SECTION-B.**
v) **The intended marks for questions or parts of questions are given in bracket [ ].**

SECTION-A [40 Marks]

(Attempt all questions from this section.)

Q.1. Choose the correct answers to the questions from the given options (Write the correct answer only) : [1×15=15]

(i) Why the screw gauge is made up of gun metal ? [1]
(a) It is the hardest substance
(b) It is cheaper than other metals
(c) It gives precise reading
(d) Its wear and tear is negligibly less

(ii) Which of the following is a contact force : [1]
(a) Electrostatic force (b) Gravitational force
(c) Frictional force (d) Magnetic force

(iii) Which of the following is true for the third law of motion. [1]
(a) Action-Reaction pair always act on the same body
(b) They act on different bodies in opposite direction
(c) Action reaction pair have the same magnitudes and direction
(d) Act on either body at normal to each other.

(iv) 1 Parsec is equal to : [1]
(a) 1.15 light year (b) 3.15 light year
(c) 3.26 light year (d) None of these

(v) **Assertion (A) :** A concave mirror is used as a shaving mirror [1]
Reason (R) : A concave mirror forms an upright and magnified image for an object placed between its pole and focus
(a) Both A and R are true
(b) A is true but R is false
(c) A is false but R is true
(d) Both A and R are false

(vi) Which of the following is not considered as naturally occuring green-house gas ? [1]
(a) CFC (b) Methane
(c) Carbon dioxide (d) Nitrous oxide

(vii) If the mass of the body is doubled and its velocity becomes half then the kinetic energy of the body : [1]
(a) becomes double
(b) remains the same
(c) becomes half
(d) becomes four times

(viii) Food chain begins with : [1]
(a) Respiration (b) Photosynthesis
(c) Decomposition (d) Decay

(ix) Without green house effect the average temperature of earth's surface would have been : [1]
(a) -18°C (b) 33°C (c) 0°C (d) 15°C

(x) The Inertia of an object tends to cause the object : [1]

(a) to increase its speed
(b) to decrease its speed
(c) to resist any change in its state of motion
(d) to decelerate due to friction

(xi) If a light ray strikes a plane mirror at an angle of 30°, the angle of reflection is : [1]

(a) 30° b) 90°
(c) 60° d) None of the above

(xii) A substance that is used as a fuel in Nuclear power plant : [1]

(a) Germanium
(b) Uranium
(c) Polonium
(d) Thorium

(xiii) A body is projeted vertically upward with an initial velocity u. After reaching to a maximum height h in time t, the body returns back to the point of projection. The correct statement is : [1]

(a) The average velocity is $2h/t$

(b) The acceleration is zero

(c) The average speed is h/t

(d) The average velocity is h/t

(xiv) 1 dyne is equal to : [1]

(a) 10^5 N (b) 10^7 N (c) 10^{-5} N (d) 10^{-7}N

(xv) A body starts moving from rest under a constant acceleration. It travels a distance x in first 10 second and distance y in next 10 second. Then : [1]

(a) y = x (b) y= 2x (c) y = 3x (d) y = 4x

Q.2. (a) Complete the following by choosing the correct answer from the brackets : [6]

(i) If the object is placed between the two plane mirrors making an angle 60°, _____ (5/6/7) images will be formed.

(ii) _____ (Negative zero error/positive zero error) is added to the observed reading to find the correct measurement.

(iii) Newton's _____ (First/second/third) law is the fundamental law of motion.

(iv) The slope of T^2 V/S ℓ graph for a simple pendulum gives _____

$$\left(\frac{4\pi^2}{g} / \frac{4\pi}{g} / \frac{8}{4\pi^2} / g\right)$$

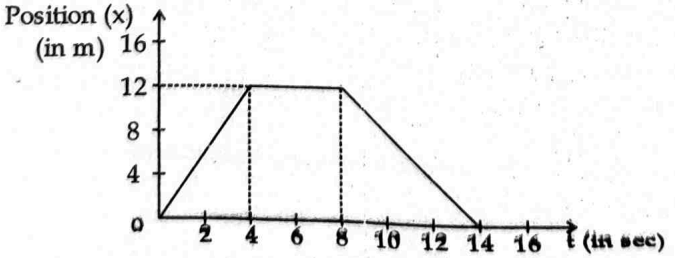
(v) In Newton's third law action is always _____ (less/equal/greater) to the reaction.

(vi) Average distance between the sun and the earth is _____ (1 astronomical unit/1 parsec)

(b) Draw the graph : [2]

(i) Showing the variation of acceleration with mass if force remains constant.
(ii) Showing the variation of acceleration with force if mass remains constant.

(c) Change the following position time graph into velocity-time graph without changing the type of motion. [2]



Q.3. (a) Write two differences between real and virtual images. [2]

(b) A force of 15 N acts on a body of mass 200 g calculate the acceleration produced. [2]

(c) What is the magnification of image in : [2]

(i) Plane mirror (ii) Convex mirror

(d) Give 2 impacts of global warming on life on earth. [2]

(e) A glass vessel breaks when it falls on a hard floor, but it does not break when it falls on a carpet. Explain the reason for it.? [2]

(f) On shaking the branches of a tree, the fruits fall down. Explain. [2]

(g) Name the kind of mirror used to obtain a : [3]

(i) real and enlarged image

(ii) virtual and diminished image

(iii) virtual and same size image

SECTION-B

(Attempt any four questions)

Q.4. (a) A screw gauge has 50 division on its circular scale and its screw moves by 1 mm on turning it by two rotations. When the flat end of the screw is in contact with stud, the zero of circular scale lies above the base line and 46th division of circular scale is in line with the base line. Find. [3]

(i) The pitch

(ii) The least count

(iii) The zero error of the screw gauge

(b) Name the law involved in : [3]

(i) Firing a bullet from a gun

(ii) Looking the face in a plane mirror

(iii) Removing the dust from a blanket

(c) A bullet of mass 50 g moving with an initial velcity of 100 ms^{-1}, strikes a wooden block and comes to rest after penetrating a distance 2 cm in it calculate : [4]

(i) Initial momentum of bullet

(ii) Final momentum of bullet

(iii) Retardation caused by wooden block

(iv) Resistive force exerted by wooden block

Q.5. (a) (i) Give 2 factors which do not affect the time period of a simple pendulum.

(ii) How much time a second's pendulum take in moving from one extreme to other extreme position. [3]

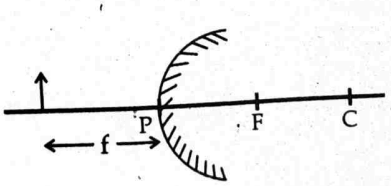
(b) Derive F = ma using second law of motion. [3]

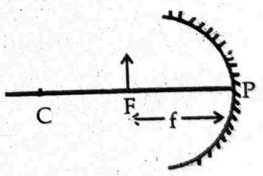
(c) At what distance infront of a concave mirror of focal length 10 cm, an object be placed so that its real image of size five times that of the object is obtained. Draw the ray diagram also. [4]

Q.6. (a) (i) A mass travels from Norway (Near the pole) to Brazil (Near equator) and observes the loss in its weight. Explain the reason. [3]

(ii) When a ball is thrown on earth it rises to 6 m height. How high will it rise on moon if thrown with the same force.

(b) Complete the ray diagrams: [3]





(c) A ball is initially moving with a velocity 0.5 ms^{-1}. Its velocity decreases at a rate of 0.05 ms^{-2}. [4]

(i) How much time will it take to stop ?

(ii) How much distance will the ball travel before it stops ?

Q.7. (a) Give the differences between mass and weight on the basis of (i) definition (ii) Nature of quantity and (iii) the instrument used to measure them. [3]

(b) A body is dropped freely under gravity from the top of a tower of height 78.4 m calculate : [3]

(i) The time to reach the ground.

(ii) Velocity with which it strikes the ground. ($g = 9.8\ ms^{-2}$)

(c) (i) A girl is swinging on a swing in a sitting position. How will the time period of swing be affected if she stands up ? [4]

(ii) The bob of a pendulum is made of ice cube. How will the time period change if the ice starts melting ?

(iii) Will a pendulum clock gain or lose time when taken to a mountain ?

(iv) Why does a pendulum eventually stop ?

Q.8. (a) A man standing in front of a mirror finds that his image is having a very small head, a fat body and legs of normal size. What are the shapes of three parts of the mirror ? [3]

(b) A car travels first 30 km with a uniform speed of 60 kmh^{-1} and then next 30 km with a uniform velocity 40 kmh^{-1} calculate : [3]

(i) the total time of journey

(ii) the average speed of car

(c) Answer in reference to gravitational force between two masses : [4]

(i) Nature of force

(ii) Effect on force if the separation between them is doubled.

(iii) Effect on force if mass of one is halved and doubled of other.

(iv) Numerical value of force acting between two masses of 1 kg each placed at a separation of 1 m.

Q.9. (a) Draw a diagram showing the temperature of various layers of water in an ice covered pond. [3]

(b) Name three factors on which the amount of heat energy contained by a body depends. [3]

(c) Water is cooled from 10°C to 0°C.

(i) Explain the initial temperature into Kelvin and final temperature into Fahrenheit. [4]

(ii) At what temperature its density will be maximum and how much ?

(iii) What is the change in temperature on kelvin scale.

(iv) Name two substances other than water which show the same phenomenon as shown by water in between this temperature range.

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