St. Thomas' School, Sunari, Agra

Specimen question paper

Half Yearly Examination (2024-2025)

Class: IX

Subject: Physics S (paper-1)

Time allowed: 2h 30min **Maximum Marks: 80**

Answers to this paper must be written on the paper provided separately.

You will not be allowed to write during the first 15 minutes.

This time is to be spent reading the question paper.

The time given at the head of this paper is the time allowed to write the answers.

Attempt all questions from Sections A, B, C, and D.

All work, including rough work, must be clearly shown and must be done on the same sheet as the rest of the answer.

The intended marks for questions or parts of questions are given in brackets [ ]

SECTION A
(Attempt all questions from this Section.)

Question 1

Choose the correct answers to the questions from the given options. (Do not copy the question, write the correct answer only.)

(i) The process by which a solid directly changes into a gas is called:
(a) sublimation
(b) condensation
(c) evaporation
(d) melting

(ii) The image formed by a plane mirror is:
(a) real and inverted
(b) virtual and erect
(c) real and erect
(d) virtual and inverted

(iii) The device used to measure electric current is:
(a) voltmeter
(b) ammeter
(c) galvanometer
(d) resistor

(iv) The magnetic field lines around a straight current-carrying conductor are:
(a) parallel to the conductor
(b) perpendicular to the conductor
(c) circular around the conductor
(d) radial from the conductor

(v) The process of splitting white light into its constituent colors is called:
(a) reflection
(b) refraction
(c) dispersion
(d) diffraction

(vi) The SI unit of electric charge is:
(a) ampere
(b) volt
(c) coulomb
(d) ohm

(vii) The type of lens used to correct nearsightedness is:
(a) convex lens
(b) concave lens

(c) bifocal lens
(d) cylindrical lens
(viii) The phenomenon of bending of light around obstacles is called:
(a) reflection
(b) refraction
(c) diffraction
(d) interference
(ix) The device that converts mechanical energy into electrical energy is called:
(a) motor
(b) generator
(c) transformer
(d) battery
(x) The type of energy associated with the motion of an object is:
(a) potential energy
(b) kinetic energy
(c) chemical energy
(d) nuclear energy
(xi) The law that relates the current, voltage, and resistance in an electric circuit is:
(a) Ohm's law
(b) Faraday's law
(c) Lenz's law
(d) Joule's law
(xii) The process of transferring heat through a vacuum is called:
(a) conduction
(b) convection
(c) radiation
(d) evaporation
(xiii) The device used to measure temperature is called:
(a) barometer
(b) thermometer
(c) hydrometer
(d) manometer
(xiv) The change in the direction of light when it passes from one medium to another is called:
(a) reflection
(b) refraction
(c) dispersion
(d) diffraction
(xv) The type of mirror used in a car's rearview mirror is:
(a) plane mirror
(b) convex mirror
(c) concave mirror
(d) parabolic mirror

Question 2
(Question 2
(i) Fill in the blanks by choosing the appropriate word/words from those given in the brackets: [5]
(a) The image formed by a convex lens is ____ when the object is placed between the lens and its focus. (real, virtual)
(b) The splitting of white light into its constituent colors is called ____. (dispersion, reflection)
(c) The SI unit of electric current is the ____. (ampere, volt)
(d) The magnetic field lines around a bar magnet emerge from the ____ pole. (north, south)
(e) The process by which a liquid change into a gas at any temperature below its boiling point is called ____. (evaporation, condensation)
(ii) State two factors that affect the resistance of a conductor. [2]
(iii) State two differences between a convex lens and a concave lens. [2]
Question 3
(i) (a) Define the term 'refraction of light'. (b) What information can be gathered from a distance-time graph? [2]
(ii) Derive the expression for the equivalent resistance of two resistors connected in parallel. [3]
(iii) (a) State whether the electrostatic force between two like charges is attractive or repulsive. (b) Write the numerical value of the speed of light in a vacuum. [2]
(iv) Explain the following: (a) The working of an electromagnet. (b) The formation of a rainbow. [2]
(v) (a) If a given mass of a gas is heated at constant pressure, what changes in its volume will be observed? (b) What is meant by the term 'biodiversity'? Name two factors that affect biodiversity. [2]

(vi) A ray of light enters from air into a glass slab of refractive index 1.5. Calculate the angle of refraction if the angle of incidence is 30 degrees. [2]
(vii) State the cause of ozone layer depletion. State two ways to minimize the impact of ozone layer depletion. [3]

Question 4

(i) The diagram below shows a ray of light incident on a glass prism.
Using the diagram, answer the following:
(a) Identify the angle of incidence and the angle of emergence.
(b) What is the name of the phenomenon responsible for the bending of light at the surfaces of the prism?
(c) If the angle of deviation is increased, what happens to the speed of light inside the prism?
(ii) An object is placed 20 cm in front of a convex lens of focal length 15 cm. Calculate:
(a) the image distance
(b) the magnification of the image
(iii) State Ohm's Law and explain how it can be verified experimentally.

Question 5

(i) State Ohm's Law and explain its application in a simple electric circuit. [3]
(ii) A concave mirror has a focal length of 10 cm. An object is placed 15 cm in front of the mirror. Calculate: [3]
(a) the image distance
(b) the nature and size of the image
(iii) Explain the following: [4]
(a) Why does the sound of a train's whistle appear to change as it approaches and then moves away from a stationary observer?
(b) Why are sound waves called mechanical waves?
(c) Why does the pitch of a guitar string change when its length is altered?
(d) What is the difference between an echo and reverberation?

Question 6

(i) Define the following terms: [3]
(a) Refractive index
(b) Dispersion of light
(c) Total internal reflection
(ii) Explain the following: [3]
(a) Why does the sky appear blue?
(b) How does a rainbow form?
(c) Why do diamonds sparkle?
(iii) Calculate the equivalent resistance of three resistors of 2 ohms, 3 ohms, and 6 ohms connected in parallel. [3]

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