CBSE EXAMINATION PAPER-2026

PHYSICS

(Solved)

Time allowed : 3 hours | Maximum Marks : 82

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **38 questions.** All questions are **compulsory.**

ii. This question paper is divided into **5 sections.**

iii. **Section A** – questions number **1 to 2** are case based questions

iv. **Section B** – questions number **3 to 18** are multiple choice questions

v. **Section C** – questions number **19 to 24** are very short answer

vi. **Section D** – questions number **25 to 32** are short answer

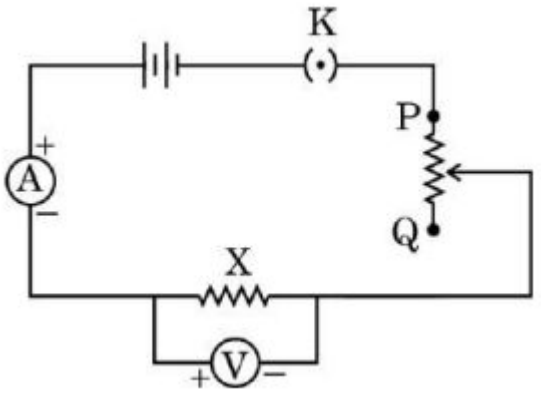
vii. **Section E** – questions number **33 to 38** are long answer

viii. There is no overall choice given in the question paper. However, an internal choice has been provided in few questions.

ix. Use of calculator is NOT allowed.

Section A

Question 1. A student sets up the circuit as shown in the figure to find the value of unknown resistance X and records a set of readings of the voltmeter and the ammeter by using the rheostat.



(1)

Error in the value of X obtained from different sets of voltmeter and ammeter readings, is :

(A) due to error in voltmeter reading only

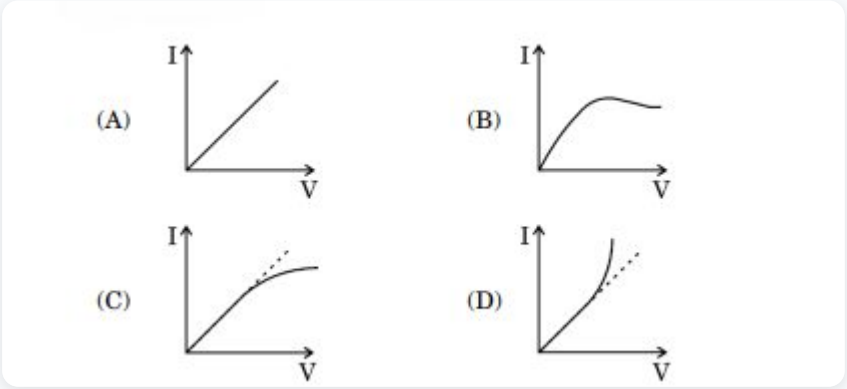
(B) due to error in ammeter reading only

(C) equal to the sum of error in voltmeter reading and error in ammeter reading

(D) equal to error in voltmeter reading divided by the error in ammeter reading

[1 Marks]

(2) If resistor X were made of manganin and readings for V and I are taken without switching off the circuit, the graph between V and I will be as :



[1 Marks]

(3)

If the movable end of rheostat is moved towards P, then :

(A) reading in ammeter decreases and reading in voltmeter increases

(B) readings in both voltmeter and ammeter increase

(C) reading in ammeter increases and reading in voltmeter decreases

(D) readings in both voltmeter and ammeter decrease

[1 Marks]

(4)

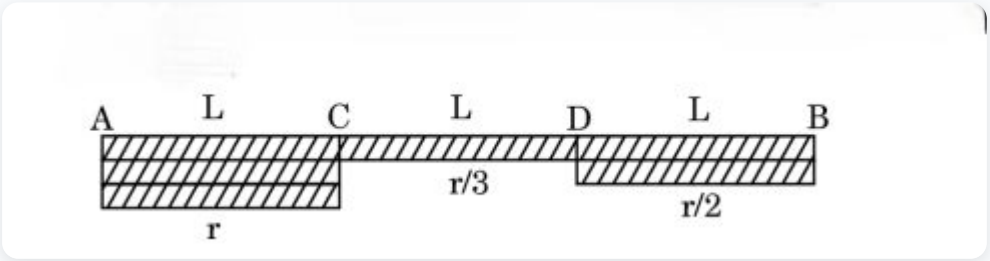
Suppose the unknown resistance X is replaced by a wire made of the same metal. This wire consists of three parts, of the same length L but has radii r, r/3 and r/2 as shown in the figure. For a particular setting of the rheostat, let v_1, v_2 and v_3 be the value of drift velocities in parts AC, CD and DB. Then:

(A) $v_1 > v_2 > v_3$

(B) $v_2 > v_3 > v_1$

(C) $v_3 > v_2 > v_1$

(D) $v_1 = v_2 = v_3$



[1 Marks]

(5)

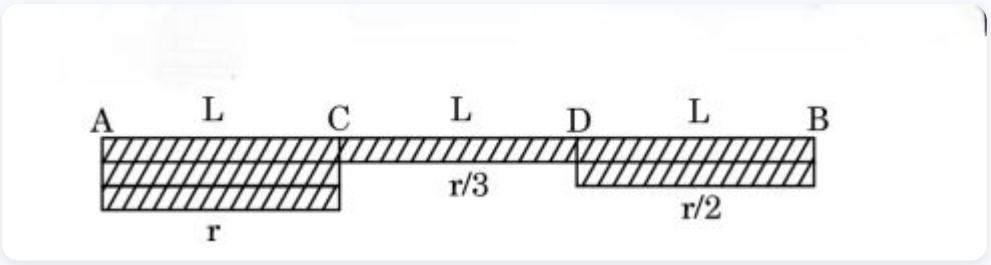
Consider the same wire, as shown in figure in question (iv) (a) connected in place of X. For a particular setting of rheostat, let E1 , E2 and E3 be the value of electric fields in part AC, CD and DB. Then :

(A) $E_1 = E_2 = E_3$

(B) $E_3 > E_2 > E_1$

(C) $E_2 > E_3 > E_1$

(D) $E_1 > E_2 > E_3$



[1 Marks]

Question 2. An astronomical telescope consists of two converging lenses. One of them of large aperture and large focal length is called objective lens and the other one, of smaller focal length and smaller aperture is called the eyepiece. It is used to see distant objects which are not seen clearly with naked eyes. The image formed by the objective lens acts as an object for the eyepiece and the final image produced by eyepiece is magnified.

(1)

The images formed by the objective lens and the eyepiece are respectively:

(A) virtual, real

(B) real, virtual

(C) virtual, virtual

(D) real, real

[1 Marks]

(2)

The magnification produced by the telescope does not depend upon the:

(A) colour of light

(B) focal length of objective lens

(C) focal length of eyepiece

(D) apertures of objective lens and eyepiece

[1 Marks]

(3)

Which of the following statements is not correct for this telescope?

(A) The focal length of objective lens (f_o) is larger than the focal length of eyepiece (f_e)

(B) Its magnifying power can be increased by increasing the focal length of objective lens (f_o)

(C) The distance between two lenses is more than ($f_o + f_e$)

(D) The magnifying power can be decreased by increasing the focal length of eyepiece

[1 Marks]

(4)

An astronomical telescope has objective lens and eyepiece of focal lengths 80 cm and 4 cm respectively. To view the image in normal adjustment, the lenses must be separated by a distance of :

(A) 84 cm

(B) 76 cm

(C) 20 cm

(D) 320 cm

[1 Marks]

(5)

Consider the telescope described in question (iv) (a). Its magnifying power in normal adjustment will be :

(A) 320

(B) 84

(C) 76

(D) 20

[1 Marks]

Section B

Question 3.

Two wires of same length and same area of cross-section but made of different material of resistivities ρ_1 and ρ_2 are connected in series. The equivalent resistivity of the combination is:

[1 Marks]

(A) $\rho_1 + \rho_2$

(B) $\sqrt{(\rho_1\rho_2)}$

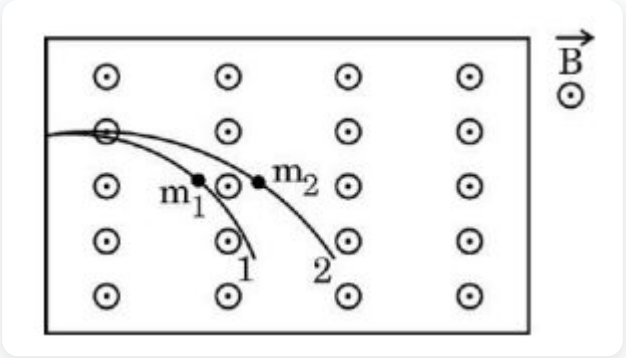
(C) $2(\rho_1 + \rho_2)$

(D) $1/2(\rho_1 + \rho_2)$

Question 4.

Two particles of masses m_1 and m_2 having charges q_1 and q_2 respectively are projected with the same velocity in a region of uniform magnetic field □□ pointing vertically upward. If they describe circular paths as shown in the figure, one may conclude that:

[1 Marks]



(A) $m_1/m_2 > q_2/q_1$

(B) $m_1/m_2 > q_1/q_2$

(C) $m_1/m_2 < q_1/q_2$

(D) $m_1/m_2 < q_2/q_1$

Question 5.

An electron moves around the nucleus in a circular orbit of radius r and makes n revolutions per second. The value of equivalent current in the orbit is:

[1 Marks]

(A) ne/r

(B) e/nr

(C) ne

(D) e/n

Question 6.

The dimensions of the rate of change of magnetic flux are:

[1 Marks]

(A) $[M\ L^2\ T^{-3}\ A^{-2}]$

(B) $[M\ L^2\ T^{-3}\ A^{-1}]$

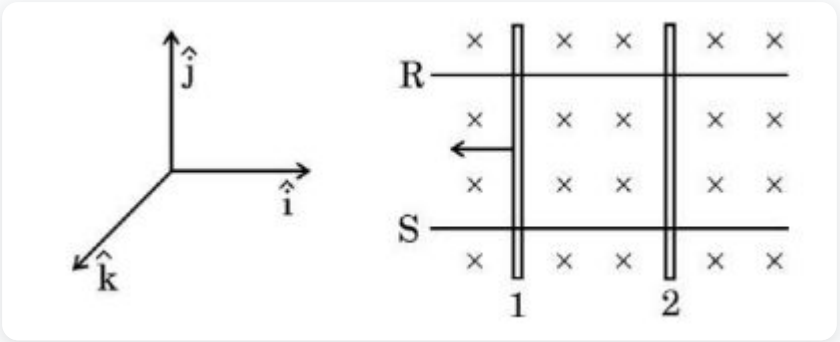
(C) $[M\ L\ T^{-3}\ A]$

(D) $[M\ L^2\ T^{-2}\ A^{-1}]$

Question 7.

Two identical conductors 1 and 2 are placed on two frictionless conducting rails R and S in a uniform magnetic field directed vertically downward into the plane of the page. If conductor 1 is moved with a constant velocity in the direction as shown in figure, the force on conductor 2 will be along:

[1 Marks]



(A) $-\hat{i}$

(B) $\hat{k}$

(C) $\hat{j}$

(D) $-\hat{j}$

Question 8.

An ac voltage is given as V = 14 sin (314t) V. The average and the effective value of the voltage (in V) over a cycle are respectively:

[1 Marks]

(A) 10 and 0

(B) 10 and 14

(C) 14 and 7

(D) 0 and 10

Question 9.

The ratio of amplitude of electric field to the amplitude of the magnetic field associated with an electromagnetic wave propagating in glass (n = 1.5) is:

[1 Marks]

(A) 5×10^{-9} m s^{-1}

(B) 3.3×10^{-9} m s^{-1}

(C) 3×10^{8} m s^{-1}

(D) 2×10^{8} m s^{-1}

Question 10.

While studying photoelectric emission from a given surface, the wavelength of the incident radiation is changed from 600 nm to 400 nm, keeping the intensity of radiation the same. Then:

[1 Marks]

(A) cut-off potential will increase

(B) cut-off potential will decrease

(C) saturation current will increase

(D) saturation current will decrease

Question 11.

Radiation of wavelength 331 nm irradiates the following metals: Which of the following statements is correct?

[1 Marks]

Metal	Work Function (eV)
Na	1·92
K	2·15
Ca	3·20
Mo	4·17

(A) Only Na and K show photoelectric emission

(B) All of the given metals show photoelectric emission

(C) None of them show photoelectric emission

(D) Only Mo will not show photoelectric emission

Question 12.

The kinetic energy of a charged particle is increased to four times of its initial value. The de Broglie wavelength associated with the particle will:

[1 Marks]

(A) increase by 100% of its initial value

(B) decrease by 25% of its initial value

(C) decrease by 50% of its initial value

(D) increase by 50% of its initial value

Question 13. Paschen series in spectrum of hydrogen atom lies in:

[1 Marks]

(A) infrared region

(B) visible region

(C) ultraviolet region

(D) partly in ultraviolet region and partly in visible region

Question 14.

In a reversed-biased p-n junction diode, the applied voltage mostly drops across:

[1 Marks]

(A) p-region only

(B) n-region only

(C) the diode

(D) depletion region

Question 15. Assertion (A): The work done, in taking a unit charge around a closed loop of an electric circuit involving cells and resistors in the loop, is zero. Reason (R): The potential at a point depends on the location of the point in the loop. After completing one round, the charge comes back to the point of start.

[1 Marks]

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A)

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A)

(C) Both Assertion (A) and Reason (R) are false

(D) Assertion (A) is true, but Reason (R) is false

Question 16.

Assertion (A): When a ferromagnetic substance is heated to high temperature it becomes paramagnetic in nature. Reason (R): The disappearance of magnetisation of a ferromagnet is abrupt and not gradual.

[1 Marks]

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A)

(B) Assertion (A) is true, but Reason (R) is false

(C) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A)

(D) Both Assertion (A) and Reason (R) are false

Question 17.

Assertion (A): When a convex lens made of glass is immersed in water, its converging power increases. Reason (R): The focal length of a lens depends only on the radii of curvature of its two faces.

[1 Marks]

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A)

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A)

(C) Both Assertion (A) and Reason (R) are false

(D) Assertion (A) is true, but Reason (R) is false

Question 18. Assertion (A): The conductivity of an n-type semiconductor is higher than that of a p-type semiconductor at a given temperature. Reason (R): The electrons being in the conduction band in n-type semiconductor are more mobile than the holes in the valence band in p-type semiconductor.

[1 Marks]

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A)

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A)

(C) Assertion (A) is true, but Reason (R) is false

(D) Both Assertion (A) and Reason (R) are false

Section C

Question 19.

An electric dipole consists of two point charges +1 μC and –1 μC, held 10 cm apart. It is subjected to a uniform electric field of 100 N/C. Calculate the amount of work done in turning the dipole from its position of stable equilibrium to the position of unstable equilibrium, in the field.

[2 Marks]

Question 20.

State Huygens principle. How did Huygens justify the absence of the backward wave on a spherical wavefront?

[2 Marks]

Question 21.

In a single-slit diffraction experiment, light of wavelength λ illuminates the slit of width ‘a’. The diffraction pattern is observed on a screen kept at distance D from the slits.
(i) Depict variation in intensity in the fringe pattern with the angular position of the fringes.
(ii) How is the linear width of central maximum affected when separation between the slit and the screen is decreased?

[2 Marks]

Question 22.

A small bulb is placed at the bottom of a tank, containing a transparent liquid of refractive index √2, to a depth of 1 m. Calculate the area of the surface of the liquid through which light from the bulb emerges.

[2 Marks]

Question 23.

Draw the graph showing the variation of number of scattered alpha particles (N) detected with scattering angle (θ) in Geiger–Marsden experiment. Infer two conclusions from the graph.

[2 Marks]

Question 24.

The hole concentration in an intrinsic semiconductor is 5×10^{8} m^{-3}. When it is doped with certain impurity, the electron concentration becomes 4×10^{12} m^{-3}. Find the new value of the hole concentration. Also identify the type of new semiconductor formed after doping.

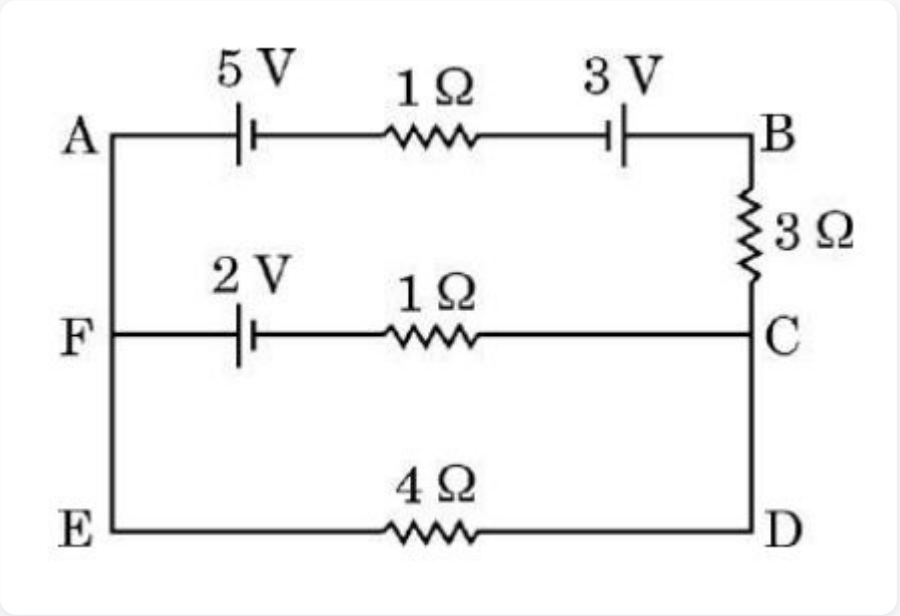
[2 Marks]

Section D

Question 25.

State Kirchhoff's rules. Using these rules, find the current flowing through branch FC in the given circuit.

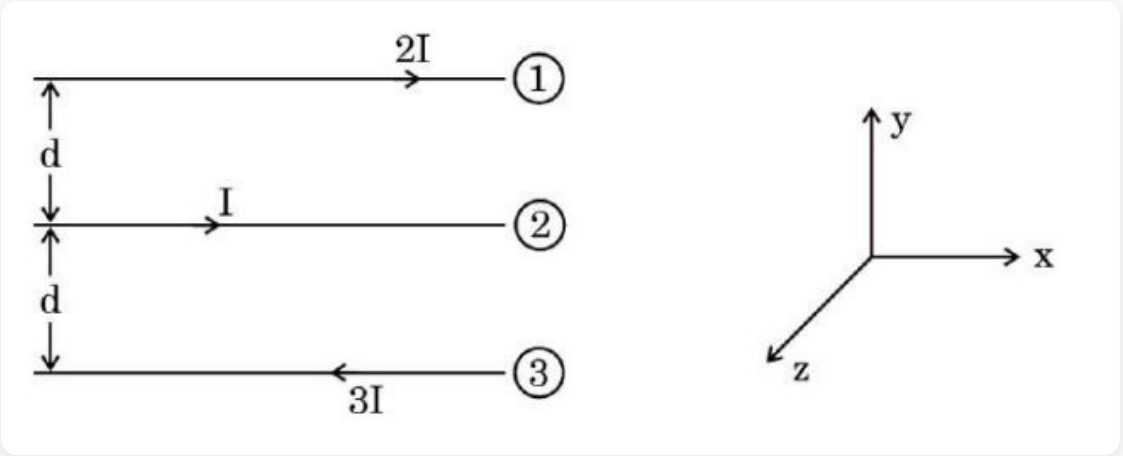
[3 Marks]



Question 26.

The figure given below shows three straight long parallel conductors ①, ② and ③ kept in x-y plane, carrying currents 2I, I and 3I respectively as shown in figure.
Find the magnitude and direction of:
(i) net magnetic field at a point on conductor ① and
(ii) net magnetic force acting on unit length of conductor ①, due to conductors ② and ③.

[3 Marks]



Question 27.

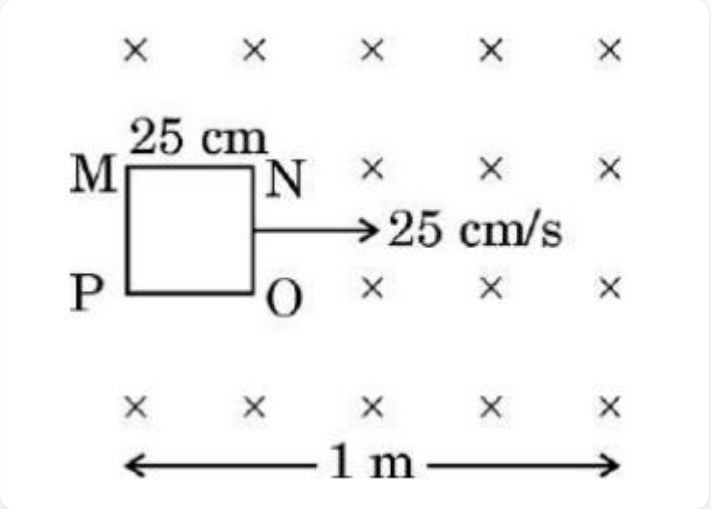
A rectangular loop of sides l and b and resistance 'R' is kept in a region in which the magnetic field varies as $B = B_0 \sin \omega t$.
(i) Derive the expression for the emf induced in the loop.
(ii) Find the effective value of current that flows in the loop.

[3 Marks]

Question 28.

The figure given below shows a square-shaped loop MNOP of side 25 cm placed horizontally in a uniform magnetic field B(vector) directed vertically downward. The position of the loop at t = 0 s is as shown in figure. The loop is pulled with a constant velocity of 25 cm/s till it goes out of the field.
(a) What will be the direction of the induced current in the loop as it goes out of the field? For how long would the current in the loop persist?
(b) Plot graphs showing the variation of magnetic flux and magnitude of induced emf as a function of time.

[3 Marks]



Question 29.

What are infrared waves ? Why are these waves referred to as 'heat waves' ? Give any two uses of these waves.

[3 Marks]

Question 30.

(a) Explain how the dual aspect of matter is evident in the de Broglie relation.
(b) Radiation of wavelength λ is incident on a photosensitive surface. Find the de Broglie wavelength of electrons emitted from the surface. Assume that the work function of the surface is negligible.

[3 Marks]

Question 31.

In the nuclear reaction:
$^{2}_{1}H + {}^{2}_{1}H \rightarrow {}^{A}_{2}X + {}^{1}_{0}n$
(a) Find the value of A.
(b) Calculate the amount of energy released in the reaction.
Given: $m(^{2}_{1}H) = 2.014102$ u, $m(^{A}_{2}X) = 3.016049$ u,
$m(^{1}_{0}n) = 1.008665$ u, 1 u = 931.5 MeV/c^2

[3 Marks]

Question 32.

With the help of a circuit diagram, explain the working of a full wave rectifier. Depict the input and output waveforms.

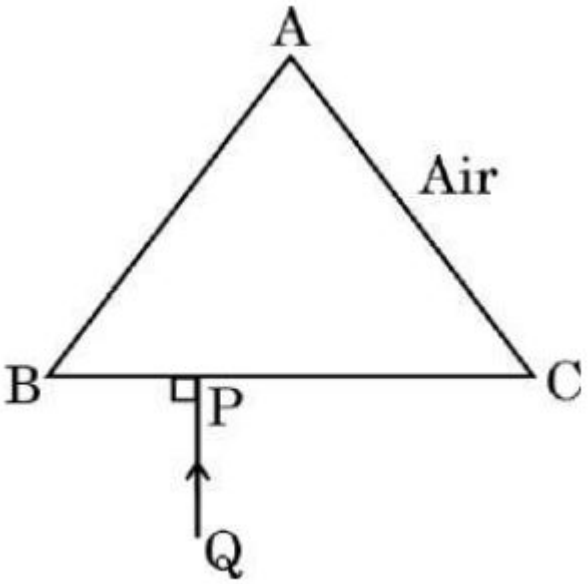
[3 Marks]

Section E

Question 33.

(i) Define refractive index of a medium in terms of speed of light.
(ii) Derive the relation for the refractive index (μ) of a prism in terms of angle of minimum deviation (δ_m) and angle of prism (A).
(iii) A ray of light QP is incident normally on the face BC of a triangular prism ABC of refractive index 1.5 kept in air, as shown in the figure. Trace the path of the ray as it passes through the prism and give relevant explanation.

[5 Marks]



Question 34.

(i) What is the difference between a ray and a wavefront ?

(ii) A plane wave is incident on a reflecting surface. Using Huygens principle, show how it is reflected from the surface. Hence, verify the law of reflection.

(iii) Depict refraction of a plane wave by a convex lens.

[5 Marks]

Question 35.

(i) Define the terms (I) resonant frequency, and (II) power factor of a series LCR circuit. For what value of the power factor will the power dissipated in the circuit be maximum?
(ii) An inductor of $5/\pi$ H, a capacitor of $50/\pi$ μF and a resistor of 400 Ω are connected in series across an ac voltage $v = 140 \sin (100\pi t)$ V. Calculate:
(I) impedance of the circuit, and
(II) rms value of current that flows in the circuit.
(Take $\sqrt{2} = 1.4$)

[5 Marks]

Question 36.

(i) Draw a labelled diagram of a step-up transformer. Obtain the ratio of secondary voltage to primary voltage in terms of number of turns in the two coils.
(ii) The number of turns in the primary and the secondary coil of an ideal transformer are 100 and 5000 respectively. If 3.3 kW power is supplied to the transformer at 220 V, find
(I) current in the primary coil, and (II) output voltage.

[5 Marks]

Question 37.

(i) Explain the following statements giving reason:
(a) An equipotential surface through a point is normal to the electric field at that point.
(b) When a dielectric is placed in an external electric field, the electric field inside the dielectric is less than that outside it.
(c) The potential difference between the plates of a charged parallel plate capacitor decreases when its plates are brought closer.
(ii) Obtain an expression for the work done to dissociate the system of three charges q, –4q and 2q placed at the vertices A, B and C respectively of an equilateral triangle of side ‘a’.

[5 Marks]

Question 38.

(i) Answer the following giving reason:
(I) The electron drift speed is estimated to be only a few mm/s for currents in the range of a few amperes. How, then, is the current established almost the instant a circuit is closed?
(II) A low voltage supply from which one needs high currents must have very low internal resistance. Why?
(III) The assertion that V = IR is a statement of Ohm’s law is not true. Why?

(ii) Two cells of emfs 12 V and 6 V are connected in parallel as shown in the figure. Their internal resistances are 1 Ω and 0.5 Ω respectively. Calculate the emf and internal resistance of the equivalent cell between points A and B.

[5 Marks]

