

75) State Huygen's principle :

Ans → According to Huygen's principle, each point on a wave front is a source of secondary waves, which added up to give a wave front at any later time.

76)

76) What is threshold frequency? (प्रथम आवृत्ति)

Ans → The minimum value of the frequency of incident radiation below which the photoelectric emission stops altogether is called threshold frequency.

77) In α -particle scattering experiment, name the target nucleus.

Ans → Gold nucleus.

PATTERN CLASSES

Kamrup district

78) What is eddy current? (वर्तमान प्रवाह क्या है?)

Ans →

79) Write the dimension of Planck's constant? (प्लैंक स्थिरांक का आयाम)

Ans → $E = h\nu \Rightarrow h = \frac{E}{\nu}$ | $[h] = \left[\frac{E}{\nu} \right] = \left[\frac{ML^2T^{-2}}{T^{-1}} \right] = [ML^2T^{-1}]$

80) Define the drift velocity of charge carriers?

आवेश वाहकों का सरासरी वेग क्या है?

Ans →

Q1) What is quantisation of charge?

আধানের কোটায়িত্ব কাকে বলে?

Ans →

Q2) $Wb = \text{Tesla } m^2$

Q3) If an object is placed at the focus of a convex lens then the image will form at _____?

উত্তল লেন্স ফোকাসের অবস্থায় বস্তু লক্ষ্যস্থলে সঠিক বাস্তবিত্ব প্রতিবিম্ব বস্তু গঠন করে -

Ans → Infinity

Sivasagan district

Q4) Which experiment established the fact that electric charge is quantised?

কোনটি পরীক্ষায় আধানের কোটায়িত্ব প্রতিপন্ন করে?

Ans → Millikan oil drop experiment.

Q5) If a body contains n_1 electrons and n_2 protons, calculate the amount of total charge on the body?

কোনটি বস্তুতে n_1 ইলেকট্রন এবং n_2 প্রোটন থাকে, তেজিয়ায়তে বস্তুটির

মোট আধানের মান গণনা কর।

Sol → Total positive charge = $+n_2e$

Total negative charge = $-n_1e$

Total charge = $(+n_2e) + (-n_1e)$

= $n_2e - n_1e$

= $(n_2 - n_1)e$ //

86) Define the mobility of charge carriers? (3 marks)

Ans →

87) Write Biot-Savart law in vector form?

বায়ের টুইট-সার্টের সূত্রের ভেক্টর রূপ লিখ?

Ans →
$$\vec{dB} = \frac{\mu_0}{4\pi} \frac{I (d\vec{l} \times \vec{r})}{r^3}$$

88) An electron moves with a velocity v along x -axis, the magnetic field is applied along y -axis, then in which direction the magnetic force will act.

Ans →

89) Name the experimentalist who carried a long series of experiment on electromagnetic induction.

বিদ্যুৎ চুম্বকীয় আবেগে উদ্ভাবকীয় প্রায়শিক পরীক্ষার সর্বপ্রথম কেউ পরীক্ষা করেছেন তার নাম লিখ?

Ans → ~~Faraday~~ Faraday.

90) If the frequency of alternating current is doubled then what happens to the capacitive reactance? (3 marks)

Ans →
$$X_c = \frac{1}{\omega c}$$

$$\Rightarrow X_c = \frac{1}{2\pi f c}$$

$$\Rightarrow X_c \propto \frac{1}{f}$$

If frequency is doubled then the capacitive reactance ~~also~~ become ~~double~~ half

$$X_c' = \frac{1}{2\pi (2f) c} \quad \left| \begin{array}{l} X_c' = \frac{1}{2} \times \frac{1}{2\pi f c} \\ \Rightarrow X_c' = \frac{X_c}{2} \end{array} \right.$$

(Q1) What is the principle of an optical fiber?

উত্তর → Total internal reflection.

(Q2) Why nuclear fusion reaction is also called ~~thermo~~ thermonuclear reaction.

নিউক্লিয়ার সংযোজন বিক্রিয়ার কারণে তাপ নিউক্লিয়ার বিক্রিয়া হোলে এটি ?

উত্তর → To overcome coulomb repulsion, the fusing nuclei are given enough thermal energy by raising their temperature to $10^6 - 10^7$ K. That is why nuclear fusion is also called thermonuclear reaction.

(Q3) When Si is doped with a pentavalent impurity then which type of semiconductor is formed.

উত্তর → n-type.

PATTERN CLASSES

PYQ'S CASE

2024

(Q4) A small object is placed at the bottom of a vessel filled with water ($n = \frac{4}{3}$) upto a height H . When viewed from a point above the surface of water, the object appears raised by n percent of H . The value of n is —

- (a) 15 (b) 25 (c) 20 (d) 33

Solⁿ

- Q16) A bar magnet is cut into two equal halves parallel to its magnetic axis. The physical quantity that remains unchanged —
- (a) Pole strength
 - (b) ~~1/2~~ magnetic moment
 - (c) Moment of inertia
 - (d) magnetic moment.

PATTERN CLASSES

- Q17) ~~Some other~~ Which of the following physical quantities remain the same for X-ray, red light and radio waves when travelling through a medium?
- (a) Wavelength
 - (b) Speed
 - (c) Frequency
 - (d) Momentum.

- Q18) In Young's double slit experiment the intensity on the screen is I_0 at a point where path difference is λ . The intensity at the point where path difference $\lambda/4$ is —
- (a) $I_0/4$
 - (b) $I_0/2$
 - (c) I_0
 - (d) $3I_0/4$.

- Q19) A plane electromagnetic wave is propagating in space along X-axis. If the magnetic field component of the wave is given below, write an expression for its electric field —
- $B_y = 2 \times 10^{-7} \sin(kx - \omega t)$

Solⁿ Given $B_y = 2 \times 10^{-7} \sin(kx - \omega t)$

$$B_0 = 2 \times 10^{-7} \quad E_0 = 2 \times 10^{-7} \times 3 \times 10^6$$

$$= 6 \times 10^{-1}$$

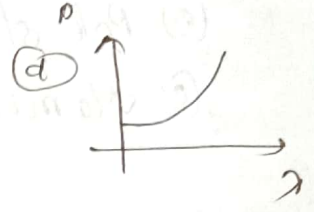
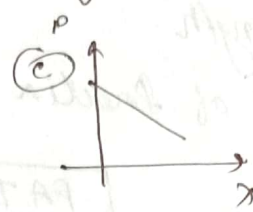
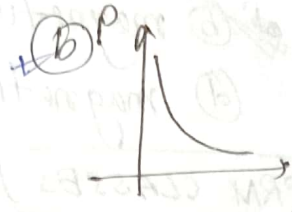
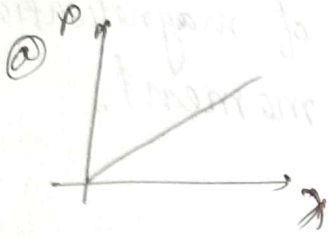
$$= 0.6$$

As $c = \frac{E_0}{B_0}$

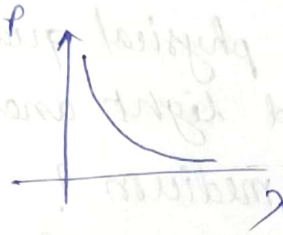
$\Rightarrow E_0 = B_0 \times c$

$\therefore E_z = E_0 \sin(kx - \omega t) = 0.6 \sin(kx - \omega t)$

150
 (100) which of the following fig. represents the variation of a particle's momentum with the de-Broglie wavelength associated with it?



Solⁿ
 $\lambda = \frac{h}{p}$
 $\lambda \propto \frac{1}{p}$
 $p \propto \frac{1}{\lambda}$



PATTERN CLASSES

(101) What is the phase difference between voltage and current in LCR circuit at resonance.

Solⁿ In a resonance LCR circuit the current and the voltage are in same phase so the phase difference is zero.

(102) Of two metals A and B if it is found $\chi_A > 1$ and $-1 < \chi_B < 0$ Name the type of material to which the metals A and B do belong.

Solⁿ

(103) What determines the intensity of light in photon picture of light?

Solⁿ In photon picture of light the intensity of light is determined by the number of photons incident per unit time in a area.

(104) The electric field $E = 0$ in a region do you think pot. at the region should also be zero.

Solⁿ ~~here~~ we have the relation-

$$E = - \frac{dv}{dx}$$

If $E = 0$ in a region -

$$\frac{dv}{dx} = 0$$

$$\Rightarrow dv = 0$$

$$\Rightarrow \int dv = \int 0$$

$$\Rightarrow v = \text{const}^n$$

\therefore If $E = 0$ in a region then the pot. at that region may not be zero.
 \Rightarrow

(105) Write the mathematical expression of the postulate that an electron has to strictly follow in order to revolve round the that nucleus.

Ans - Bohr's quantum condition -

$$mvr = n \left(\frac{h}{2\pi} \right)$$