(50) How does a semiconductor behaves at 0K?

Soln Insulators.

(500) RKD College Deregaon

(51) Give the dimension of Tesla

Soln $F = qBV \Rightarrow B = \frac{F}{qV}$

$\Rightarrow [B] = \left[\frac{MLT^{-2}}{AT \times LT^{-1}}\right]$

$= [ML^0T^{-2}A^{-1}]$

$B = \frac{F}{qV}$

unit of B

$B = \frac{N}{C\ m/s} = \frac{NS}{Cm}$

(52) show that weber = Volt x second.

Soln ~~Wb = volt x Sec~~

$Wb = T\ m^2$

$= \frac{NS}{Cm} \times m^2$

$\Rightarrow Wb = \frac{N}{C} \times m \times s$

$= \frac{J}{C} \times s$

$\Rightarrow Wb = Volt \times Sec$ //

(53) what is quantisation of charge? (इलेक्ट्रॉन)

Soln ~~If R and L represents~~

(54) If R and L represents resistance and Inductance respectively then what is the dimension of L/R?

Soln $Q = \frac{\omega_0 L}{R} = \frac{1}{R}\sqrt{\frac{L}{C}} = \frac{1}{\omega_0 CR}$

$\Rightarrow [Q] = \left[\frac{\omega_0 L}{R}\right]$

$\Rightarrow \left[\frac{L}{R}\right] = \left[\frac{Q}{\omega_0}\right]$

$\Rightarrow \left[\frac{L}{R}\right] = \left[\frac{M^0L^0T^0}{T^{-1}}\right]$

$= [M^0L^0T^1]$

(55) what is an α-particle ?

Sol^n → Doubley ionised He atom ie. He^{2+} is called α-particle

(56) what is reverse saturation current ? (It is independent of reverse voltage)

Sol^n The current flows through a semiconductor diode due to the diffusion of minority charge carriers when it is in reverse biased.

(57) Define mobility of a charge carriers ?

Sol^n SI unit $= \frac{m/s}{V/m} = m^2/Vs$

[PATTERN CLASSES]

Nagam dist:

(58) The property which differentiates the two kinds of charge is called ____ (polarity / mass / force) of charge.

(59) Dielectric strength of air $3 \times 10^6 Vm^{-1}$?

(60) SI unit of mobility m^2/Vs ?

(61) The magnetic moment of a current loop of radius r varies as —

(i) r^4 (ii) r^2 (iii) $\frac{1}{r^2}$

(62) Diamagnetism in superconductor is called Meissner effect

(63) Dimension of Inductance.

(a) $[ML^2T^{-1}A^{-2}]$ (b) $[MT^2A^{-1}]$ (c) $[ML^2T^{-2}A^{-2}]$

(64) What happens to the inductive reactance when the frequency of AC supply is increased?

Sol'n $X_L = \frac{1}{\omega C} \Rightarrow \frac{1}{2\pi f C}$ $\quad X_L = \omega L$

$\Rightarrow X_L \propto \frac{1}{f}$ $\quad \Rightarrow X_L = 2\pi f L$

$\Rightarrow X_L \propto f$

Thus the inductive reactance increases with increase in the frequency of AC supply.

(65) What is the phase difference between electric and magnetic field in e-m wave—

(a) 0 (b) π (c) $\pi/2$

(66) For prism, angle of minimum deviation occurs when —

(a) $i > e$ (b) $i < e$ (c) $i = e$

PATTERN CLASSES

(67) A photocell is a device which

(i) convert light energy into electricity

(ii) convert electricity into light energy

(iii) Store light energy

(68) An atom has nearly continious mass distribution in —

(Thomsons model / Rutherford's model)

(69) B

(69) A p-type semiconductor is —

(i) Positively charged

(ii) Negatively charged

✓(iii) Neutral

(70) Kokrajhar district

(70) Write down the ~~device~~ name of device, which is used to detect charge?

Ans→ Electroscope (বিদ্যুৎবীক্ষণ)

(71) Write down the dimension of electric flux?

Ans→ $\phi_E = \vec{E} \cdot \vec{A}$

$[\phi] = [E][A]$

$= \left[\frac{F}{q}\right][A]$

$\Rightarrow [\phi] = \left[\frac{ML\bar{T}^2}{AT}\right][L^2]$

$= [ML^3\bar{T}^3A^{-1}]$

(72) Write down one limitation of Ohm's law.

Ans: Ohm's law is not applicable for non-linear devices like diode and transistor it is only applicable for linear devices like resistor.

(73) What is Lorentz force?

Ans:→ The total force on a charge particle moving in an electro-magnetic field is called Lorentz force.

$\vec{F} = q\vec{E} + q(\vec{v} \times \vec{B})$ $\Rightarrow \vec{F} = q[\vec{E} + (\vec{v} \times \vec{B})]$

(74) What is Meissner Effect?

Ans:→