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Sub:- Physics

Sem:- Summer's - 20.

Question N.0 1(a)..

Answer:-

We can derive an expressions for the magnetic force on a current by taking a sum of the magnetic forces on individual charges (The force add because they are in same direction). The force on an individual charge moving at the drift velocity v_d is given by $F = qv_d B \sin \theta$. Taking B to be uniform over a length wire l and zero elsewhere, the total magnetic force on wire is then $F = (qv_d B \sin \theta)(N)$

Where N is the number of charge carriers in the section of wire length l . Now, $N = nV$, where n is the number of charge carriers per unit volume and V is the volume of wire in the field. Noting that $V = Al$, where A is the cross sectional area of the wire, then the force on the wire is $F = (qv_d B \sin \theta)(nAl)$.

Question N.O 1(b):-

Answer:-

Resistance

Resistivity^{is}

Defination

Resistance is the physical property of a substance because of which it opposes the flow of current.

Resistivity is the physical property of a substance which is having particular dimension.

Defination

Proportionality

Resistance is directly proportional to the length and temperature while it is inversly proportional to the cross sectional area of the material.

Resistivity is only proportional to the nature and temperature of the particular material.

Proportionality

Symbol R

P

Symbol

Formula $R = V/I$ or, $R = \rho(L/A)$ Formula $\rho = (R \times A)/L$

Formula

SI Units Ohms

Ohms meter

SI Unit

Applications It is used in several places like heater, fuses sensor etc.

It is used as a quality control test of calcareous soil.

Applications

Question N.O (2) - a :-

Answer:-

Reflection:-

Reflection is defined as the reflection of light when it strikes the medium on a plane. This phenomena usually occurs in mirrors. The light entering the medium returns to the same direction.

Considering the light waves they bounce from the ~~table~~ plane and change directions.

The angle of incidence of the light is equal to the ~~direction~~ reflection.

Refraction:-

Refraction can be defined as the process of the shift of light when it passes through a medium leading to the bending of light. It usually occurs in lenses. The light entering the medium travels from one medium to another. The light waves pass through the surface while simultaneously

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changes from medium to medium.

The angle of incidence is not equal to the angle of reflection.

Question N.03(a).

Answer:-

Electric Potential - It is the work done required to bring a unit positive charge from infinity to any point A in electric field.

Electric Potential Energy - It is the work done required to bring any amount of charge q from any point A to some point B in electric field.

Question N.03(b).

Answer:-

In a uniform electric field the equation to calculate the electric potential difference is $V = Ed$. In this equation V is the potential difference in volts, E is the electric field strength and d is the difference b/w two points.

Question N.o 4(a):-

Answer:-

Forward Bias:-

The forward bias decreases the resistance of diode. In forward biasing the current is easily flowing through the circuit.

Reverse Bias:-

The reverse bias increases the resistance of diode. In reverse biasing the current is not allow to flow through circuit.

Question N.O 4'(b)...

Answer:-

Breakdown of a diode occurs during its reversed biased conditions.

We know that under reverse bias the positive terminal of battery is connected to n side and the negative terminal to p side. As a result electron will be drawn towards the terminal of n side and holes

will be drawn towards terminal p side. At this condition electron hole recombination will not happen and hence minority carrier movement is absent. This is the reason a diode is not conducting in reverse bias condition. If we keep increasing the applied reverse voltage the depletion width will increase accordingly. At a point which we can call as "Break down point."

Question No (5)-a:-

Answer:-

A solenoid is a long coil of wire wrapped many times. When a current passes through it, it creates a nearly uniform magnetic field inside. Solenoids can convert electric current to mechanical action, and so are very commonly used as switches.

The magnetic field within a solenoid depends upon the current and density

of turns. In order to estimate roughly the force within which a solenoid pulls on ferromagnetic rods placed near it, one can use the change in magnetic field energy as the rod is inserted into solenoid the force roughly is

$$\text{force on rod} = \frac{\text{change in magnetic field energy}}{\text{distance rod moves in solenoids}}$$

Question N.o 5(b):-

Answer:-

All of the loops of wire which make up a toroid contribute magnetic field in the same direction inside the toroid. The sense of the magnetic field is that given by the right-hand-rule and a more detail of the field of each loop can be obtained by examining the field of single current loop.