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Q1:- A slit of ~~wide~~ width a is illuminated by white light

Part (A)

For what the value of a will the first minimum for red light of wavelength $\lambda = 650nm$ appear at $\theta = 15^\circ$

Solution:-

At the first minimum m=1 in equation [$a \sin\theta = m\lambda$, for m = 1, 2, 3..]

Solving for a, we then find.

$a = m\lambda / \sin\theta$

$= (1)(650nm)/(\sin 15^\circ)$

$= 2511 nm$

$= 2.5 \mu m$

Therefore, the value of a first minimum for red light of $\lambda = 650nm$ be at $\theta = 15^\circ$ would be $2.5 \mu m$. For the incident light to flare out that much ($\pm 15^\circ$) the slit has to be very fine indeed, amounting to about four times the wavelength. Note that a fine human hair may be about $100 \mu m$ in diameter.

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Question (1)
Part (b)

What is the wavelength λ of the light whoose first date diffrection maximum is at 15°, thus conciding with the first minimum for red light?

Answer:-

Form the above observation we conclude that, the wavelength λ' of the light whoosé first side diffrection maximum is at 15° would be 430nm. Light of this wavelength is violet.

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Q2 (Par A)

What is the difference between reflection reflection and refraction?

Answer:

There is a unique difference between Reflection and Refraction and it is important to analyze both these terms and understand the definitions of both these terms. Reflection is simply the property of a light that rebounds after hitting a surface. When light passes through a surface undergoes some changes in the appearance, whenever it usually passes through a medium, this phenomenon is ~~called~~ usually refered to as Refraction. The two different types of light that are typically involved in lights thats are incident ray and the reflected ray. Light energy is incredible and has many uses to it

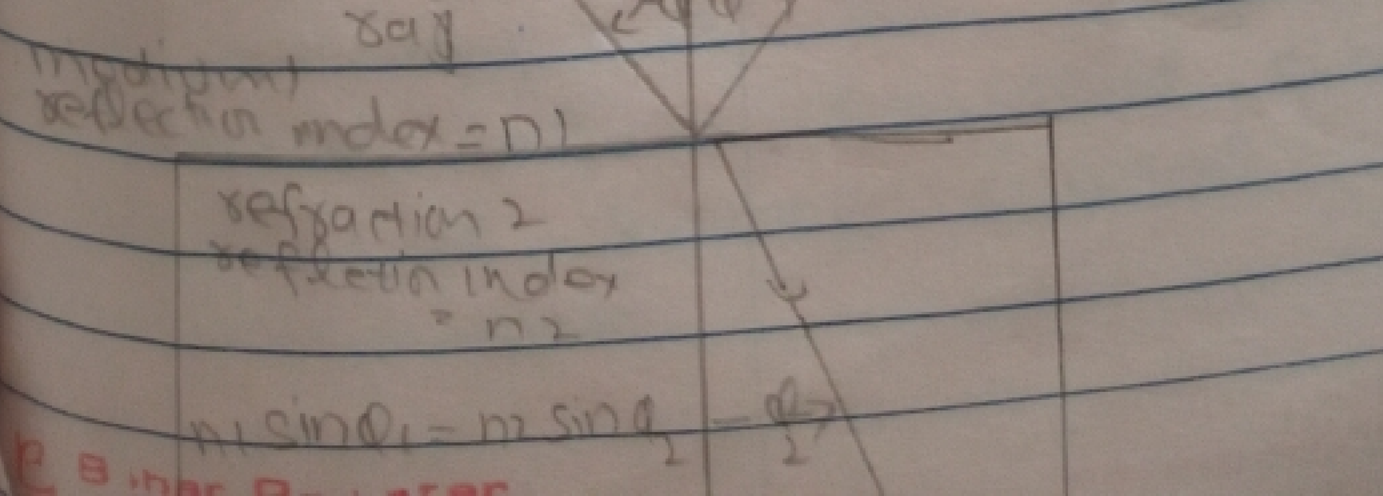
Difference between Relflection and Refraction.

~~Ref~~ Reflection	Refraction
① This phenomenon usually occur in Mirror	① The phenomenon usally occur in Lenses.
② Reflection can simply be defined as the reflection of light when it strikes medium on a plane.	② Refraction can be defined as the process of shift of light when it passes through a medium leading to be bending of light.
③ The light entering the medium return back in the same direction	③ The light entering the medium travels from one medium to another.
④ The angel of incidence of the light is equal to the angel of reflection	④ The angel of incidence is not equal to the angel of reflection.

Question 2 (Part) (B)

(A) Explain the difference among angel of incident, angel of reflection ~~with the~~ angel of refraction with the help of formulae and a singel diagram?

Answer:-
At the Point incidence when the the ray strikes the mirror. a line can be down perpendicular to the Surface of the mirror. The angel between the incident ray and normal is known the angel of ancidence. The angel between the selected ray and the moment is know as the angel of reflection.
Aslo the relationship between the angel of incidence and angel of refraction is Explained by Snell's law. Which status that ratio of the sin of angel of refraction and sin of the angel of incidence is always constant and equivalent in the ratio of Phase velocities of two medium so the law of reflection is equal to angel of incidence through this law.



Question (3)

The long solenoid S shown (in cross section) in the figure has 220 turn/cm and carries a current i = 1.5 A; its diameter D is 3.2 cm. At its center we palace a 130-turn closely packed coil C of diameter d = 2.1 cm. The current in the solenoid is reduced to zero at a steady rate in 25 ms. What is magnitude of the emf that is induced in coil C while the current in the soleniod is charging

Answer:-

The intial flux through soleniod C is :

$$\Phi_{Bi} = BA_c = \mu_0 i n_s A_c = \pi \mu_0 i n_s r^2_c$$

Now we can write

$$\frac{d\Phi_B}{dt} = \frac{\Delta\Phi_B}{\Delta t} = \frac{\Phi_{Bf} - \Phi_{Bi}}{\Delta t}$$

$$= \frac{0 - \pi\mu_0 i n_s r^2_c}{\Delta t} = -\frac{\pi\mu_0 i n_s r^2_c}{\Delta t}$$

Sub

$\frac{d\Phi_B}{dt}$

The

er

$\mathcal{E} =$

Substituting gives

$$\frac{d\Phi_B}{dt} = -\frac{\pi(4\pi \times 10^{-7}\ T.\frac{m}{A})(1.5A)}{25ms} \times (22000\ \frac{turn}{m})(0.0105m)^2$$

$$= -5.76 \times 10^{-4} V.$$

The magnitude of the induced emf is then

$$\varepsilon = N\left|\frac{d\Phi_B}{dt}\right| = (130)(5.76 \times 10^{-4} V)$$

$$= 75 mV.$$

Question 4 (A)

How to calculate the magnetic on current carry

Answer:

Magnetic force on a current carrying wire.

This relationship arises from the basic magnetic force

$F = qvB \sin\theta$

which for a charge q travelling length L in a write can be written

$F = q \frac{L}{t} B \sin\theta$

$F = \frac{q}{t} LB \sin\theta$

$F = ILB \sin\theta$

~~The magnetic force is prependicular to the magnetic field then the force is given by the Simple Product~~

The magnetic force on a current carrying wire prependicular to both the wire and magnetic field with direction given by the right hand rule

$F = IL \times B$ (force on straight wire of length)

If the current is prependicular to the magnetic field then the force is given by the simple product.

Force = current x Length x B- field

For current I = A = ☐ $\times 10^{\square}$ A

and length L = ☐ $\times 10^{\square}$ m

Positioned perpendicular to a magnetic field B = ☐ Telsa = ☐ Gauss

the force is F = ☐ $\times 10^{\square}$ N

If the angel between the current and magnetic field is ☐ degrees the force is F = ☐ $\times 10^{\square}$ N.

Q4 (Part B)

(Answer) :

current, $i = 2.8\,A$

Mass per unit length, $m/l = 46.6\,g/m$
$= 0.0466\,kg/m$

Let the magnetic field is B
the weight of the wire is balanced
the magnetic force

$mg = ilB$

$B = mg/il$

$B = (m/l) \times g/i$

$B = 0.0466 \times 9.8/28$

$B = 0.01631\,T$

Thus, the magnetic field is 0.01631T.

Question 5 (A)

What is difference between Resistance and Resistivity?

Answer:-

Resistance:-

(1) Resistance is the physical property of a substance because of which it opposes the flow of current i.e electrons.

(2) Resistance is directly proportional to the length and while it is inversely proportional to the cross sectional area of the material.

(3) Symbol R

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

V = voltage, I = current

ρ = Resistivity

(5) The SI unit of resistance in ohms.

Resistivity:-

(1) Resistivity is the physical property of a practical substance which is having partical dimensions.

(2) Resistivity is only proportional to the nature and temperature of ~~the~~ ~~ptrue~~ of the partical material

(3) Symbol:- P

(4) Formula:- P= (R×A)/L
R= Resistance, L= Length
A= Across sectional area.

(5) The SI unit of resistivity ~~y~~ is ohms meter.

Q5 (Part B)

Solution (i)

Cross sectional area of rectangular block is square:.

$S = 1.2 \times 1.2 \; cm^3 = 1.44 \times 10^{-4} \; m^2$

L is is 15cm so L = 0.15m

so $R = (9.6 \times 10^{-8} \; (0.15 / 1.44 \times 10^{-4})$

$R = 1 \times 10^{-4}$

Solution (ii)

Cross sectional area for rectangular block is rectangular

$S = 1.2 \times 15 cm^2 = 1.5 \times 10^{-3} \; m^2$

$L = 6 \; 1.2 cm = 0.012 \; m$

$R = (9.6 \times 10^{-4}) \quad (0.012 / 1.8 \times 10^{-3})$

$R = 6.4 \times 10^{-7}$ (Answer)

The End.