केन्द्र संख्या को मुहर | केन्द्र व्यवस्थापक के हस्ताक्षर

इण्टर केन्द्र [illegible]

0836

नोट–केन्द्र के नाम की मुहर उत्तरपुस्तिका के किसी भी भाग पर न लगाएं।

नोट–परीक्षार्थी उत्तरपुस्तिका के किसी भी भाग में अपना नाम व केन्द्र का नाम न लिखें।

उत्तरपुस्तिका की संख्या– | १ | २ | ३ | ४ |

हस्ताक्षर कक्ष निरीक्षक– | | | | 10 |

परीक्षार्थी द्वारा भरा जायेगा–

अनुक्रमांक (अंकों में)– [illegible]

अनुक्रमांक (शब्दों में)– [illegible]

विषय– Physics

प्रश्नपत्र संकेतांक– 429(IFE)

परीक्षा का दिन– Friday

परीक्षा तिथि– 07/03/2024

कक्ष निरीक्षक द्वारा भरा जाय–

केन्द्र संख्या– 0836

परीक्षा कक्ष संख्या– 17

उपरोक्त सभी प्रविष्टियों की जाँच मेरे द्वारा सावधानीपूर्वक कर ली गयी है।

कक्ष निरीक्षक का नाम– GEETA VERMA

दिनांक– 07-03-2024

हस्ताक्षर कक्ष निरीक्षक– 07-03-2024

प्रमाणित किया जाता है कि मैंने इस उत्तरपुस्तिका का मूल्यांकन समुचित प्रश्न–पत्र संकेतांक तथा मूल्यांकन निर्देशों के अनुसार किया है। प्राप्तांकों का मुखपृष्ठ पर अग्रसारण कर प्राप्तांकों एवं प्राप्तांकों के योग का मिलान कर लिया गया है। एवार्ड ब्लैंक में प्राप्तांकों की अंकना कर उनका पुनः मिलान भी कर लिया है। किसी भी प्रकार की त्रुटि के लिए मैं उत्तरदायी रहूंगा / रहूंगी।

परीक्षक के हस्ताक्षर एवं संख्या..... 538

1. अंकेक्षक के हस्ताक्षर एवं संख्या..... 24/04/24

2. अंकेक्षक के हस्ताक्षर एवं संख्या..... 24/04/24

सन्निरीक्षा प्रयोगार्थ

सन्निरीक्षा पूर्व अंक–

सन्निरीक्षा पश्चात् अंक–

त्रुटि का प्रकार–

दिनांक– 24-05-22

हस्ताक्षर निरीक्षक–

परीक्षक, निम्न तालिका में प्रत्येक प्रश्न तथा उसके खण्डों के प्राप्तांकों का विवरण यथास्थान भरें।

प्रश्न संख्या	क	ख	ग	घ	ङ	च	छ	ज	झ	ञ	योग
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योग (शब्दों में)– [illegible] योग (अंकों में)

ANSWER 01

(a) Electric Feild opt (iii)

(b) $m^2 V^{-1} s^{-1}$ opt (ii)

(c) $\frac{1}{\sqrt{LC}}$ opt (iii)

(d) Gamma waves opt (iii)

(e) detect the current

opt (i)

(f) 25 cm opt (iv)

(g) perpendicular to wave front

opt (ii)

(h) α particles

opt (ii)

(i) Both A & R are correct & R is the correct explaination of A.

opt (i)

(ii) A is correct but R is in correct.

opt (iii)

ANSWER 26

[Case Study]

(a) Ampere's circuital law -

The line integral of magnetic field (B) & length element (dl) is equal to permiability of free space times current.

$$\oint B \cdot dl = \mu_0 I$$

$$\oint B\, dl \cos\theta = \mu_0 I$$

(b) Ampere circuital law is based on closed integral of boundary whereas Bio savents law calculates magnetic fields without intrig rating boundary.

PTO.

Ampere Avantal law

$$\oint B \cdot dl = \mu_0 I$$

Biot Savarts law

$$B = \frac{\mu_0}{4\pi} \frac{I dl \sin\theta}{R^2}$$

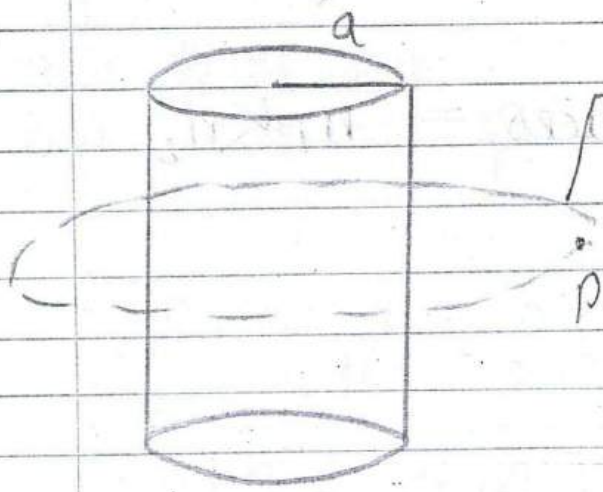
Note Ampere maxwell law –

$$\oint B dl = \mu_0 (I_c + I_d)$$

(C) Given => $r = a$

current $= I$

To find => $\vec{B} = ?$ at $r > a$



applying ACL –

$$\oint B dl = \mu_0 I$$

$B \oint dl = \mu_0 I$

[B is constant]

$B [2\pi a] = \mu_0 I$ [circumference is $2\pi a$]

$B = \frac{\mu_0 I}{2\pi a}$

$$B = \frac{\mu_0 I}{2\pi a}$$ Ans

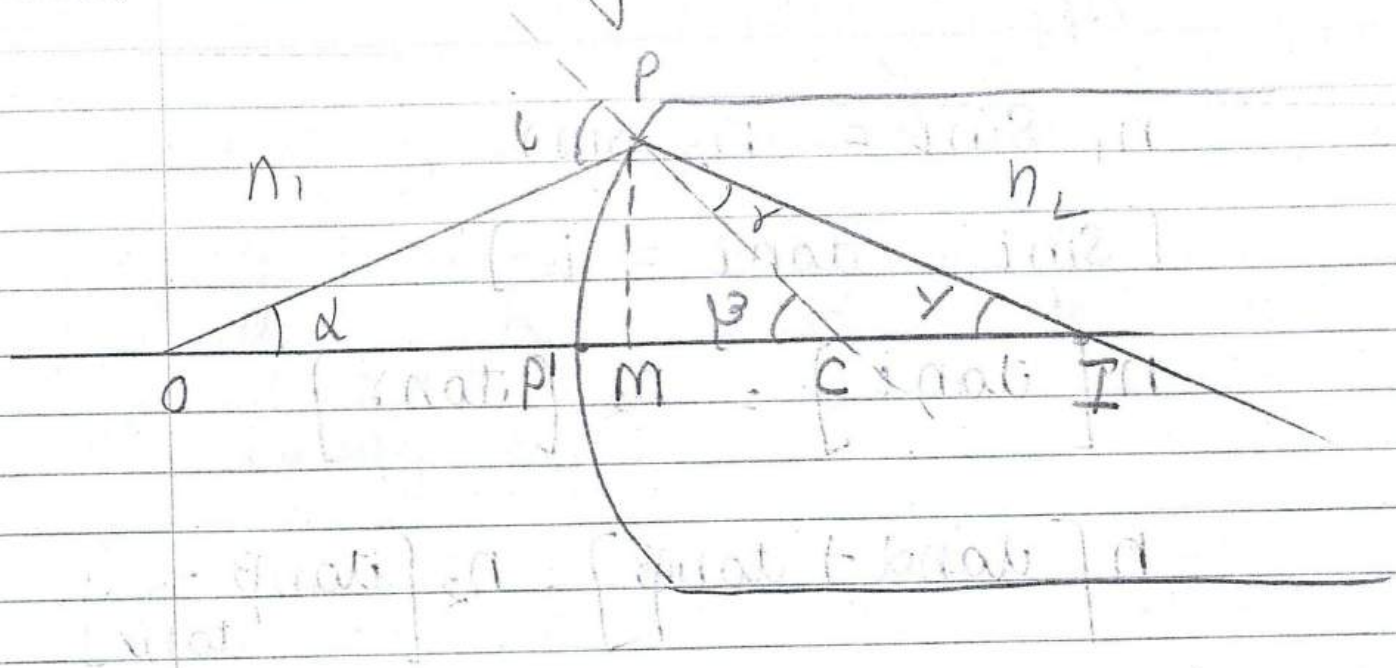
ANSWER 25

Refraction through a spherical surface -

Refractive Indices = n_1 & n_2

PTO

1) Convex surface -



⇒ Let angle blw principle axis & Refracted, Incident, ray, Normal be r, α, β.

⇒ $i = \alpha + \beta$ [External Angle property]

⇒ $i = \alpha + \beta$ — (I)

⇒ $\beta = r + \gamma$

⇒ $r = \beta - \gamma$ — (II).

⇒ Since the angles are very small so

$[\theta = \tan\theta]$

Applying snells law -

$n_1 \sin i = n_2 \sin r$

$[\sin i = \tan i = i]$

$n[\tan i] = n_2[\tan r]$

$n[\tan\alpha + \tan\beta] = n_2[\tan\beta - \tan\gamma]$

Since -

$\tan\alpha = \frac{PM}{OM}$

$\tan\beta = \frac{PM}{MC}$

$\tan\gamma = \frac{PM}{MI}$

$n_1\left[\frac{PM}{OM} + \frac{PM}{MC}\right] = n_2\left[\frac{PM}{MC} - \frac{PM}{MI}\right]$

$n_1\left[\frac{1}{OM} + \frac{1}{MC}\right] = n_2\left[\frac{1}{MC} - \frac{1}{MI}\right]$

$$\frac{n_1}{OM} + \frac{n_1}{MC} = \frac{n_2}{MC} - \frac{n_2}{MI}$$

Putting actual values =>

$$\Rightarrow \frac{n_1}{u} + \frac{n_1}{R} = \frac{n_2}{R} - \frac{n_2}{v}$$

=> Putting signs -

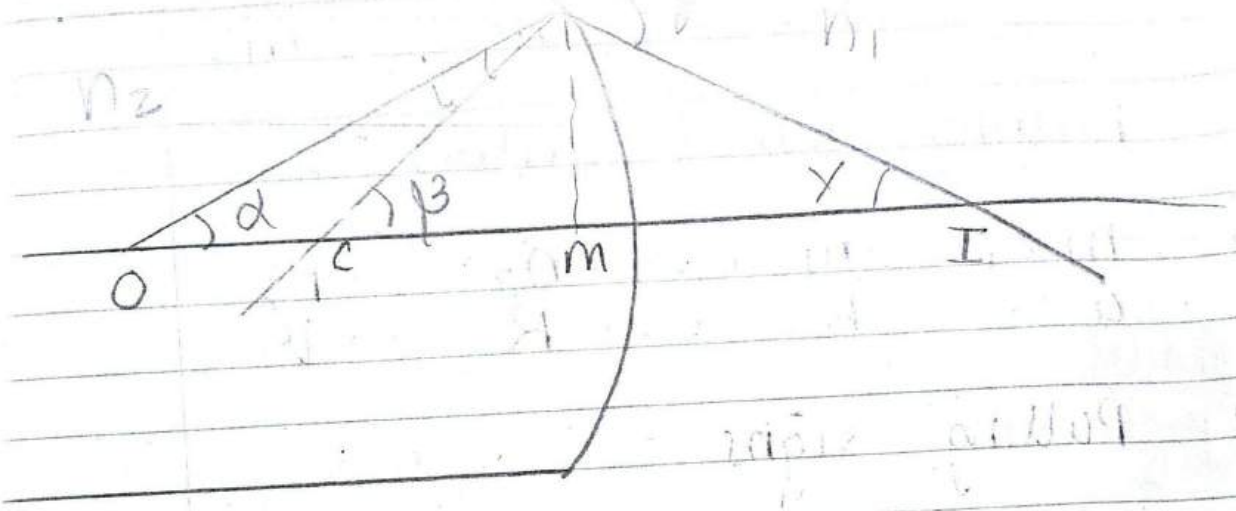
$u = -u$
$v = +v$
$R = +R$

$$\Rightarrow -\frac{n_1}{u} + \frac{n_1}{R} = \frac{n_2}{R} - \frac{n_2}{v}$$

$$\Rightarrow \frac{n_2}{v} - \frac{n_1}{u} = \frac{n_2 - n_1}{R}$$

R = Radius
v = image distance
u = object distance.

(2) Refraction through concave surface



By the above figure -

$\beta = \alpha + i$ [Ext angle prop.]

$i = \beta - \alpha \quad -(1)$

Since angles are small

$\tan i = \tan\beta - \tan\alpha$

$\Rightarrow \quad r = \beta + \gamma$

$\tan r = \tan\beta + \tan\gamma$

Applying snells law -

$n_2 \sin i = n_1 \sin r$

$[\sin\theta = \tan\theta = \theta]$

$$n_2[\tan\beta - \tan\alpha] = n_1[\tan\beta + \tan\gamma]$$

$$n_2\left[\frac{PM}{MC} - \frac{PM}{MO}\right] = n_1\left[\frac{PM}{MC} + \frac{PM}{MI}\right]$$

$$n_2\left[\frac{1}{MC} - \frac{1}{MO}\right] = n_1\left[\frac{1}{MC} + \frac{1}{MI}\right]$$

$$n_2\left[\frac{1}{R} - \frac{1}{u}\right] = n_1\left[\frac{1}{R} + \frac{1}{v}\right]$$

$u = -u$
$v = +v$
$R = -R$
} Sign convention.

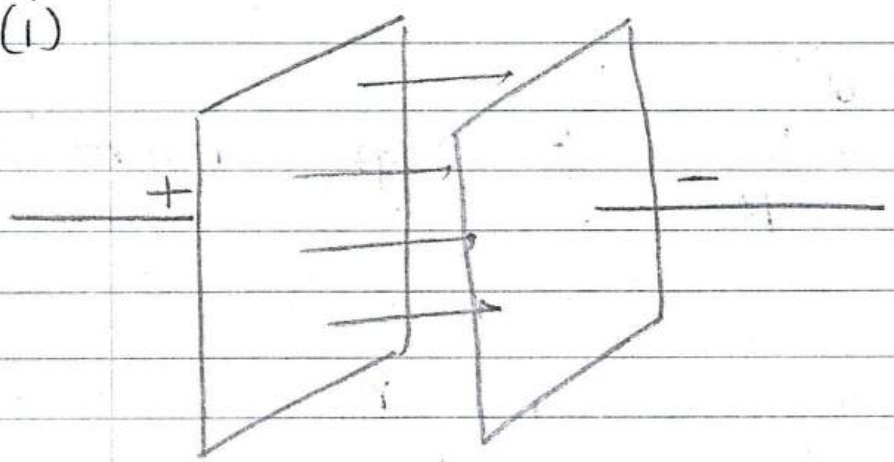
$$\boxed{\frac{n_1}{v} - \frac{n_2}{u} = \frac{n_1 - n_2}{R}}$$

u = Object dist.
v = Image dist.
R = Radius of ~~convex~~ concave surf

ANSWER 24

Capacitor = It is a device which stores Energy in form of charge, it gets uncharged / discharged very quickly.

(i)



We know that $\vec{E}$ due to sheet is -

$$E = \frac{\sigma}{2\varepsilon_0}$$

Here are 2 sheets with opposite charge

$$E = \frac{\sigma}{2\varepsilon_0} + \frac{\sigma}{2\varepsilon_0}$$

$$E = \frac{\sigma}{\varepsilon_0} \quad \left[\sigma = \frac{Q}{A}\right]$$

$$E = \frac{Q}{A\varepsilon_0}$$

$$V = E \times d$$

$$V = \frac{Qd}{A\varepsilon_0} \quad \text{— (1)}$$

The relation is —

$$Q = CV$$

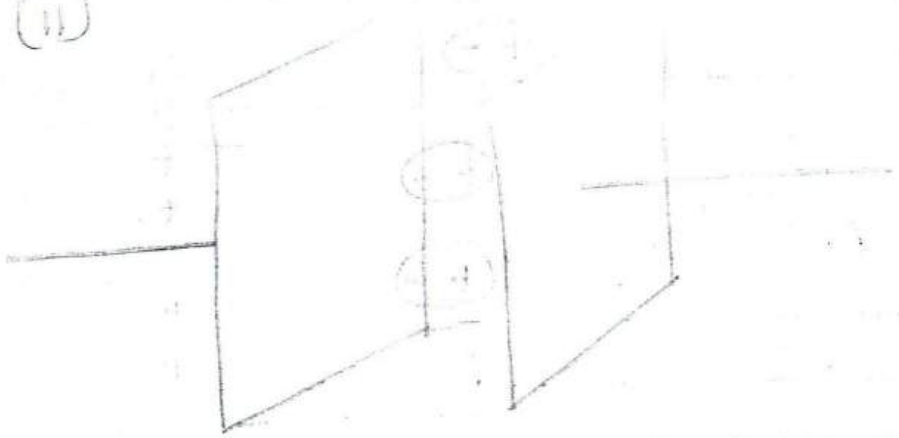
$$\Rightarrow \quad C = \frac{Q}{V}$$

$$C = \frac{Q}{Qd} A\varepsilon_0 \quad [\text{by eq (1)}]$$

$$C = \frac{A\varepsilon_0}{d}$$

$$C = \frac{\varepsilon_0 A}{d} \quad \text{Ans}$$

(11)



Sina dielectric material polarises in opposite direction to ext $\vec{E}$

The net $\vec{E}$ will be -

$$\vec{E} = \left(\sigma - \frac{\sigma p}{\varepsilon_0}\right)$$

[σp = Areal charge density due to dielectric]

$$\vec{E} = \left(\sigma - \frac{\sigma p}{\varepsilon_0}\right)$$

$$(\sigma - \sigma p) = \frac{\sigma}{K}$$

$$\vec{E} = \frac{\sigma}{K\varepsilon_0}$$

$$E = \frac{\sigma}{K\varepsilon_0} = \frac{E_{initial}}{K}$$

Similarly -

$$V = \frac{V_{initial}}{K} \quad \leftarrow (1)$$

$$V = \frac{\sigma d}{K\varepsilon_0} = \frac{Qd}{KA\varepsilon_0}$$

Since $Q = CV$

$$C = \frac{Q}{V}$$

$$C = \frac{Q}{\frac{V_{initial}}{K}} \quad [\text{by } (1)]$$

$$C = \frac{KQ}{V}$$

$$C = \frac{KQ}{Qd} A\varepsilon_0$$

$$\boxed{C = \frac{KA\varepsilon_0}{d}}$$

(iii) for metals

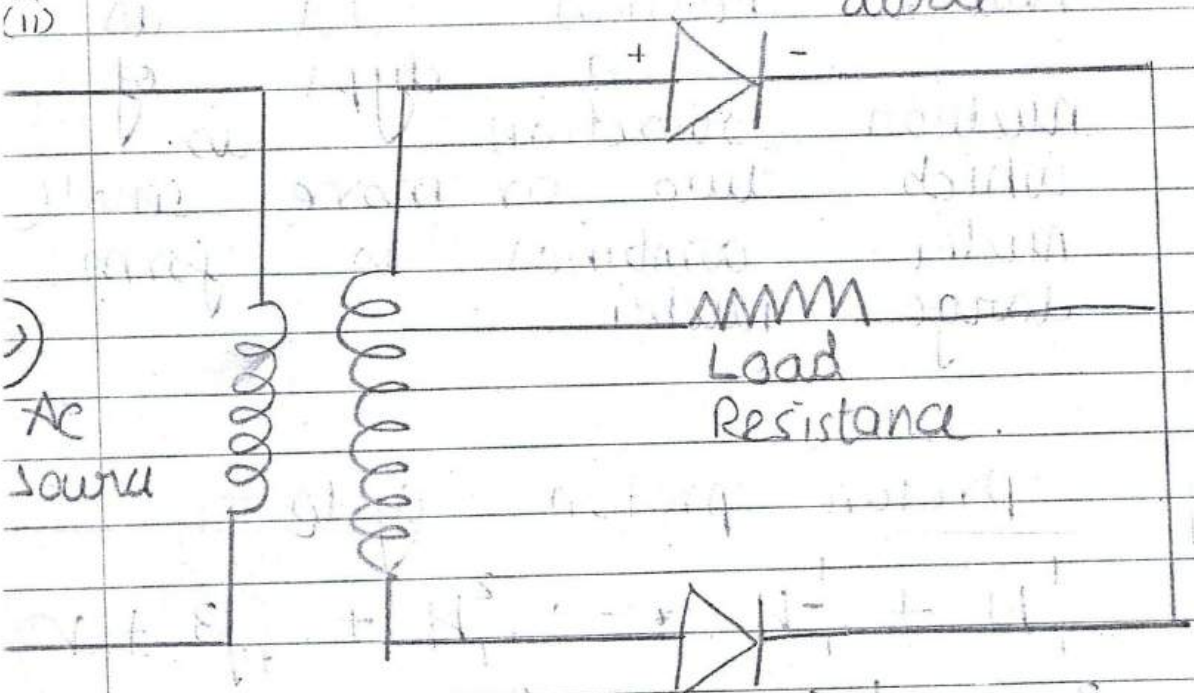
K = Infinite

$$\Rightarrow \quad C = \frac{K \varepsilon_0 A}{d}$$

$$\Rightarrow \quad \boxed{C = \infty}$$ Ans

c) It is a full wave rectifier

(ii)



FULL WAVE RECTIFIER.

NOTE :- $f_{out} = 2 f_{in}$ is full wave rectifier.

(i) This process is Nuclear Fussion

(ii) Nuclear Fussion = It is a type of nuclear reaction in which two or more small nuclei combines to form large nuclei.

Eg. proton proton cycle -

$$_{1}^{1}H + _{1}^{1}H \longrightarrow _{1}^{2}H + _{+1}\beta + \nu$$

$$_{1}^{2}H + _{1}^{1}H \longrightarrow _{2}^{3}He + E$$

$$_{2}^{3}He + _{1}^{1}H \longrightarrow _{2}^{4}He + \nu + E$$

→ This process occurs in Sun.

Significance -

(PTO)

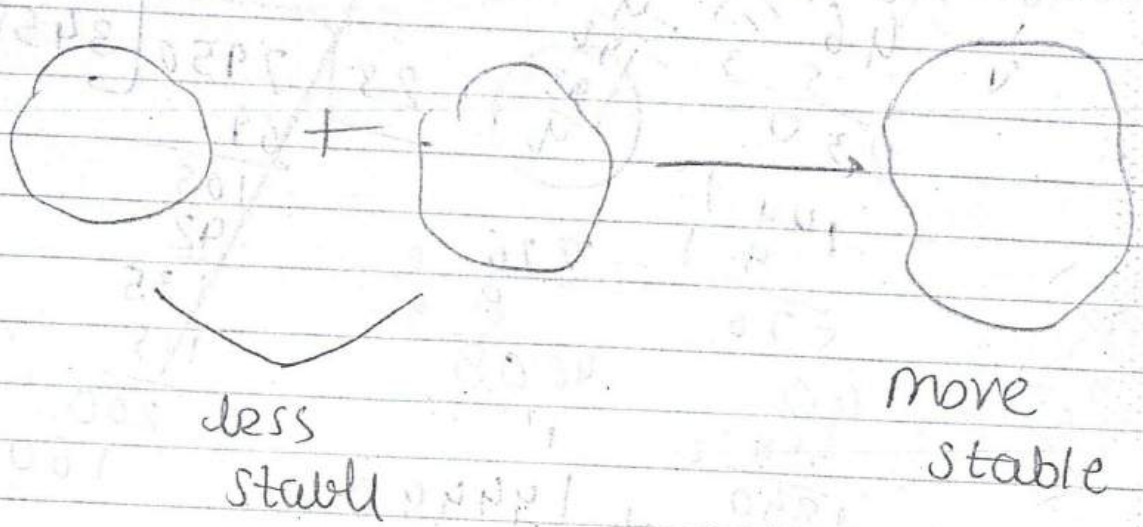
form Hydrogen bomb.

(ii) It occurs in Sun by two ways —

(a) proton proton cycle
(b) C-N cycle.

(iii) It requires very high Temp (10^7) thats why it is nearly impossible to perform it in Earth.

) No radioactivity is emitted through it.



केन्द्राध्यक्ष का हस्ताक्षर	केन्द्र व्यवस्थापक के हस्ताक्षर
0836	

नोट–केन्द्र के नाम की मुहर उत्तरपुस्तिका के किसी भी भाग पर न लगाएं।

नोट–परीक्षार्थी उत्तरपुस्तिका के किसी भी भाग में अपना नाम व केन्द्र का नाम न लिखें।

परीक्षार्थी द्वारा भरा जाय–

अनुक्रमांक (अंकों में)– [ ] अनुक्रमांक (शब्दों में) .....

विषय Physics प्रश्नपत्र संकेतांक– 429 (IFE)

कक्ष निरीक्षक द्वारा भरा जाय–

केन्द्र संख्या– 0836

परीक्षा कक्ष संख्या– 17

(उपरोक्त सभी प्रविष्टियों की जाँच मेरे द्वारा सावधानीपूर्वक कर ली गई है।)

कक्ष निरीक्षक का नाम GEETA VERMA

दिनांक–07-03-2024

हस्ताक्षर कक्ष निरीक्षक– 07-03-2024

परीक्षक के हस्ताक्षर व संख्या 538

पी0एस0यू0 (आर0ई0) 17 उ0वि0शि0प0 / 36–14–06–2023–2,11,000 उत्तर पुस्तिकाएं (कम्प्यूटर / ऑफसेट)।

ANSWER 21

Bohr Model –

(1) Quantization condition – e^- can only revolve is those orbits whose orbital angular momentum is integral multiple of $\frac{h}{2\pi}$

$$L = \frac{nh}{2\pi}$$

$$\boxed{mvr = \frac{nh}{2\pi}}$$

(2) e^- revolves is a particular orbit having particular Energy level.

$$\left[E = -13.6 \left(\frac{Z^2}{n^2} \right) eV \right]$$

P.T.O

(3) While revolving in an atom e^- neither gains nor looses Energy.

→ It was explination of Maxwell theory.

(4) While revolving in a particular orbit when Energy is given to e^- then it jumps to higher orbit.

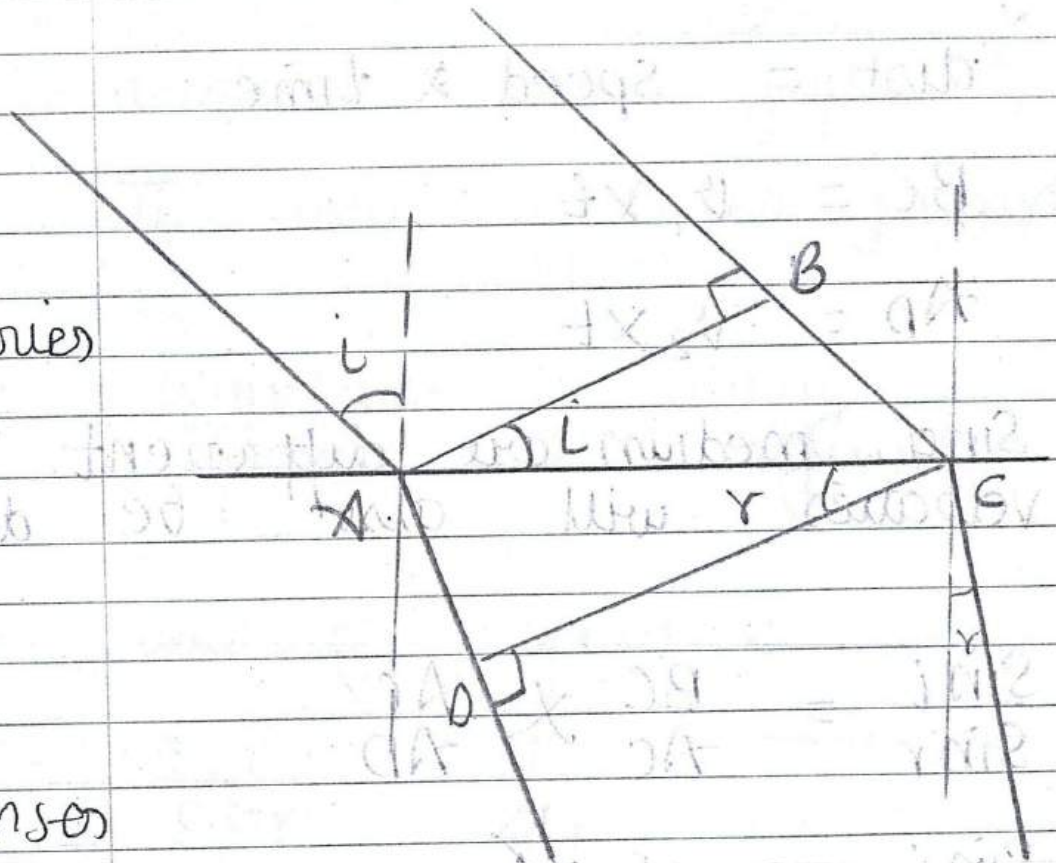
(5) When e^- comes to lower orbit it emits Energy.

(6) Bohr Radius = $\frac{n^2 h^2 \varepsilon_0}{\pi m Z e^2}$

$= 0.529 \times \frac{n^2}{Z} \cdot A^\circ$

Bohr velocity = $2.18 \times 10^6 \left(\frac{Z}{n}\right)$ m/s.

ANSWER 20



→ According to Hygens -

AB = Incident wave front
DC = refracted wave front.

In ΔABC & ΔACD -

$$\sin i = \frac{BC}{AC}$$

$$\sin r = \frac{AD}{AC}$$

of light is -

dist = Speed × time

$BC = v_1 \times t$

$AD = v_2 \times t$

Since medium are different velocities will also be differe

$$\frac{\sin i}{\sin r} = \frac{BC}{AC} \times \frac{AC}{AD}$$

$$\frac{\sin i}{\sin r} = \frac{v_1 \times t}{v_2 \times t}$$

$$\frac{\sin i}{\sin r} = \frac{v_1}{v_2}$$

$$\left[\mu_1 = \frac{c}{v_1} \right]$$

$$\frac{\sin i}{\sin r} = \frac{\mu_2}{\mu_1}$$

This law is known as Snells law.

(2) sina Refracted ray, Incident ray & normal die is same plane according its figure.

II law is also proved.

Note Wavefront is always ⊥ to Incident & refracted ray.

→ law of refraction are :-

I- $\frac{\sin i}{\sin r} = \frac{\mu_2}{\mu_1}$

II- Incident, refracted ray & normal die is same plane.

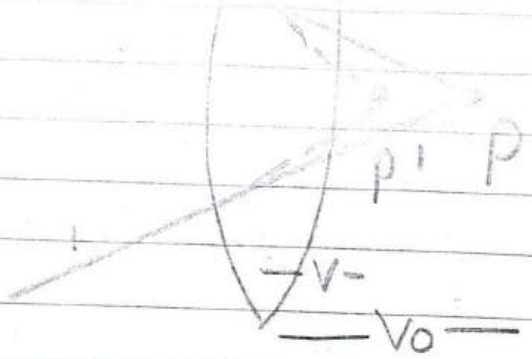
Hence proved

ANSWER 19.

PTO.

(1)

convex lens.



given = $f = +20\,cm$

To find = $V = ?$

Applying Lens formula for initial condition:

$$\frac{1}{f} = \frac{1}{V} - \frac{1}{u} \qquad [u = v_o]$$

$$\frac{1}{20} = \frac{1}{v} - \frac{1}{12}$$

$$\frac{1}{V} = \frac{1}{20} + \frac{1}{12}$$

$$\frac{1}{V} = \left(\frac{6+10}{120}\right)$$

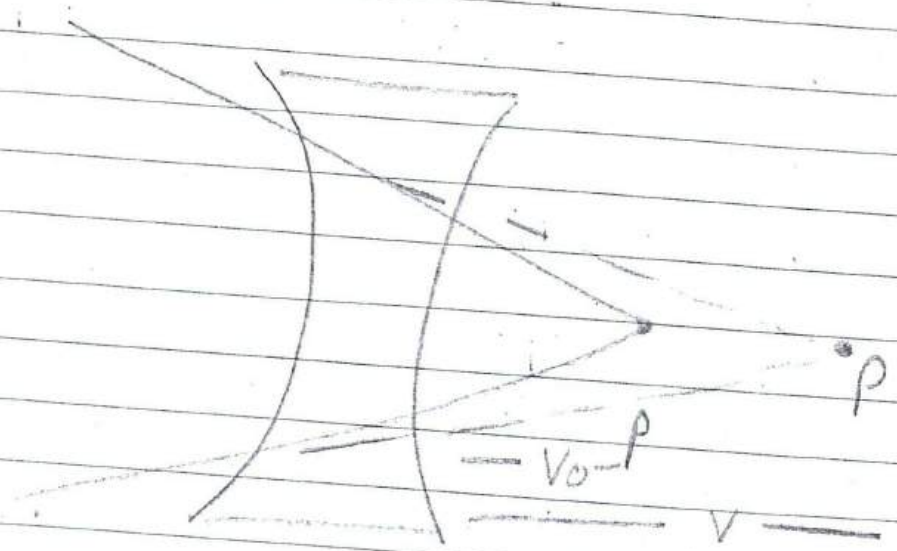
$$\Rightarrow \quad V = \frac{120}{16}$$

$$\frac{1}{V} = \frac{120}{16} \quad \frac{16}{120}$$

$$\frac{1}{v} = \frac{1}{7.5}$$

$$\boxed{v = 7.5\,cm}$$ Ans

(ii)



Given = $f = -16\,cm$
$u = 12\,cm$

To find = $v = ?$

Applying lens formula —

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

$-16 \qquad V \qquad 12$

$$\frac{1}{-16} = \frac{1}{V} - \frac{1}{12}$$

$$\frac{1}{V} = -\frac{1}{16} + \frac{1}{12}$$

$$\frac{1}{V} = \frac{+12 + (-16)}{-16 \times 12} = \frac{4}{192}$$

$$\frac{1}{V} = \frac{-4}{-192}$$

$$V = \frac{192}{4}$$

$$V = 48cm$$ Ans

concave lens diverges the light.

उत्तराखण्ड विधानसभा [illegible] (उत्तराखण्ड)

केन्द्र सुपरिटेन्डेन्ट के हस्ताक्षर	नोट–परीक्षार्थी उत्तरपुस्तिका के किसी भी भाग में अपना नाम व केन्द्र का नाम न लिखें।
0836	
नोट–केन्द्र के नाम की मुहर उत्तरपुस्तिका के किसी भी भाग पर न लगाएं।	

परीक्षार्थी द्वारा भरा जाय–

अनुक्रमांक (अंकों में)– [ ] अनुक्रमांक (शब्दों में)

विषय Physics. प्रश्नपत्र संकेतांक– 429 (IFE)

कक्ष निरीक्षक द्वारा भरा जाय–

केन्द्र संख्या– 0836

परीक्षा कक्ष संख्या– 17

(उपरोक्त सभी प्रविष्टियों की जाँच मेरे द्वारा सावधानीपूर्वक कर ली गई है।)

कक्ष निरीक्षक का नाम GEETA VERMA

दिनांक– 07-03-2024

हस्ताक्षर कक्ष निरीक्षक– 07-03-2024

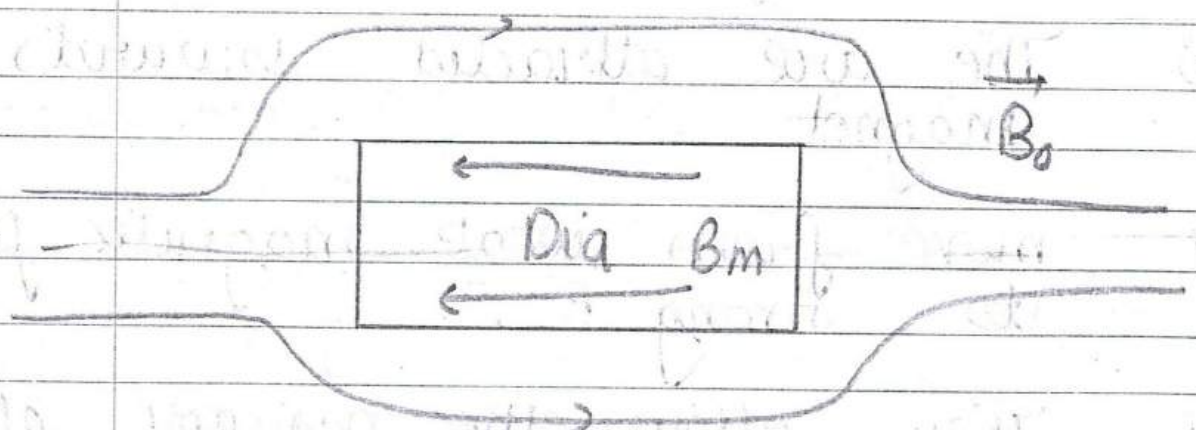
परीक्षक के हस्ताक्षर व संख्या 538

पी0एस0यू0 (आर0ई0) 17 उ0वि0शि0प0/36–14–06–2023–2,11,000 उत्तर पुस्तिकाएं (कम्प्यूटर/ऑफसेट)।

(1) Diamagnetic Substances -

- These substances repel magnet
- moves from strong $\vec{B}$ to weak $\vec{B}$.

⊙ Not allow passage of $\vec{B}$ lines -



- They magnitise in opposite direction to Ext $\vec{B}$.

$$B_T = B_0 - B_m$$

$$\boxed{B_T < B_0}$$

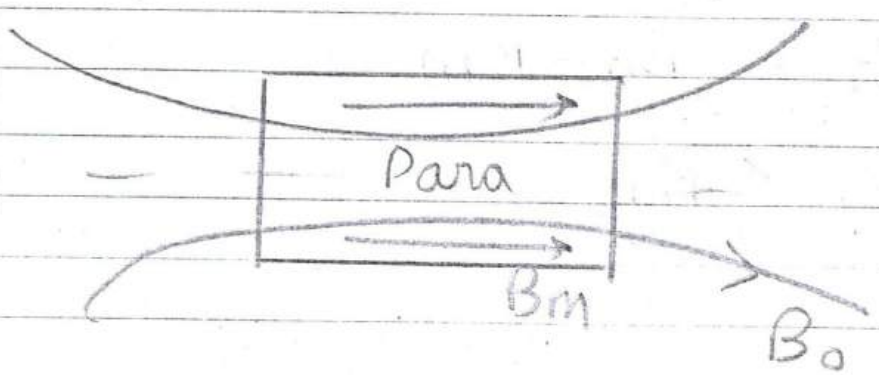
$\chi_m = \mu_r - 1$

χ_m is negative for diamagnetic substance.

↳ Susceptibility. Eg. Cu, Zn etc

(2) Paramagnetic Substance –

- ⊙ The are attracted towards magnet.
- ⊙ move from weak magnetic field to strong $\vec{B}$.
- ⊙ They allow the passage of $\vec{B}$ lines.
- ⊙ contain unpaired e^-.



- They magnetisi is direction of $\vec{B}_{ext}$.

$$B_T = B_0 + B_m$$

$$B_0 < B_T$$

- $\mu > 1$ = positive no.

$$\chi_m = \mu_r - 1$$

- χ_m = small positive value.

Eg. Na, Al etc.

---

(3) Ferromagnetic substance -

- Strongly attracted towards magnet.
- allow passage of $\vec{B}$ lines.
- magnetise is direction of $\vec{B}$.

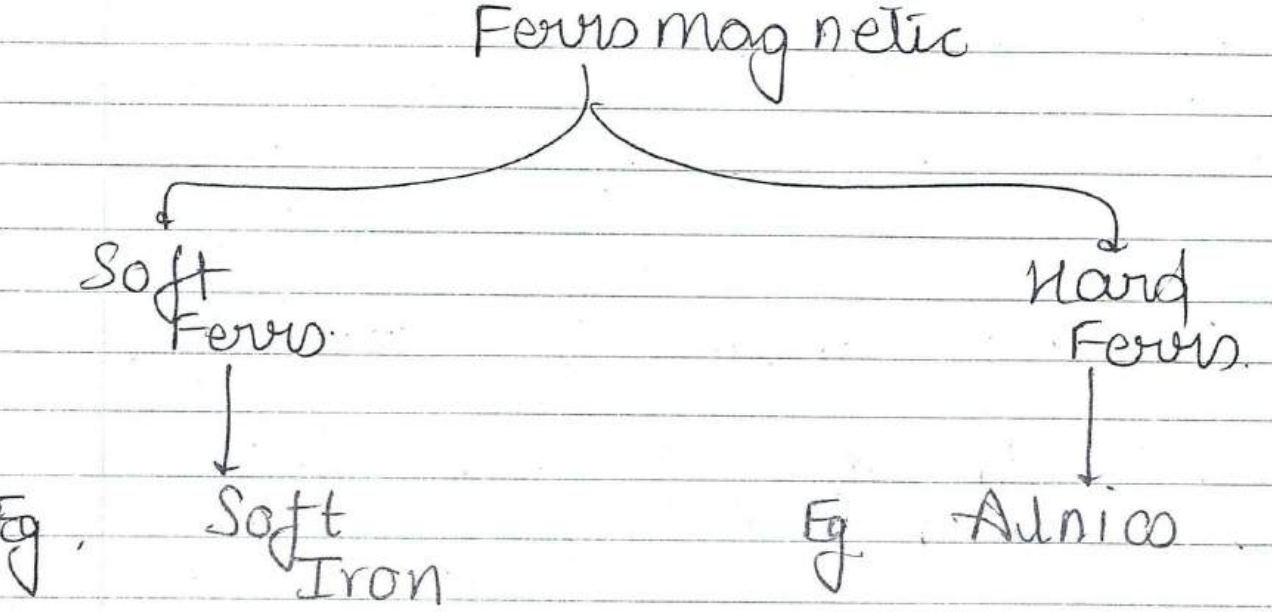
PTO.

Ferro

- $B_T = B_m + B_o$

  $B_T \gg B_o$

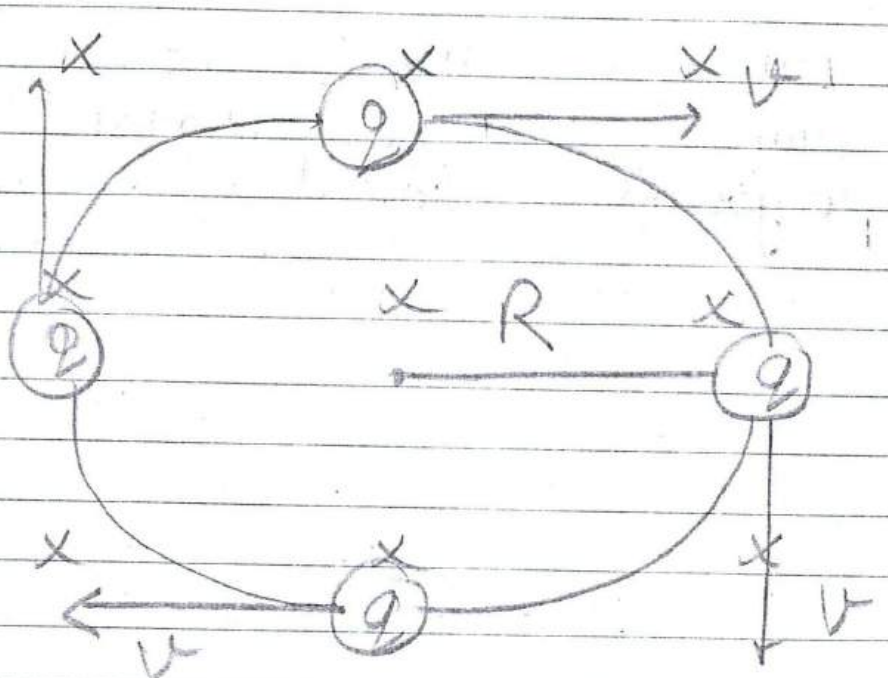
- $\mu_o \ggg 1$
- $\chi_m \gggg 1$



ANSWER 17

Given = charge = Q q
mass = m
velocity = v

R = ?



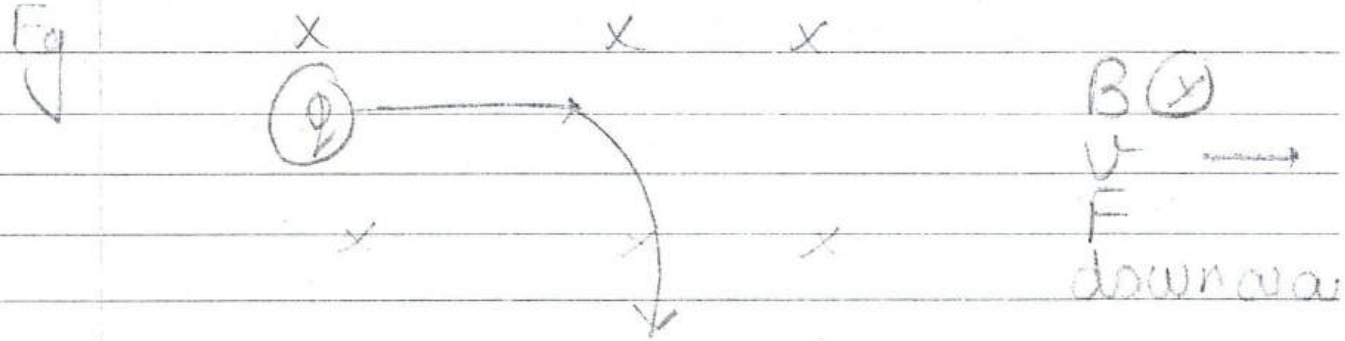
We know that when a charge particle enters in $\vec{B}$ it experiences a Force.

$$F = QVB \sin\theta$$

Since $\theta = 90°$

- When the particle moves with V velocity then according to Flemings left hand rule. the force will be downwards after a certain distance.

- Due to this continiously changing Force charge particle performs circular motion.



due to circular motion. it will have a centripetal Force which will be equal to the magnetic Force.

$$\Rightarrow \quad F_C = F_B$$

PTO

$$\Rightarrow \quad qvB = \frac{mv^2}{R}$$

$$\Rightarrow \quad R = \frac{mv^2}{qvB}$$

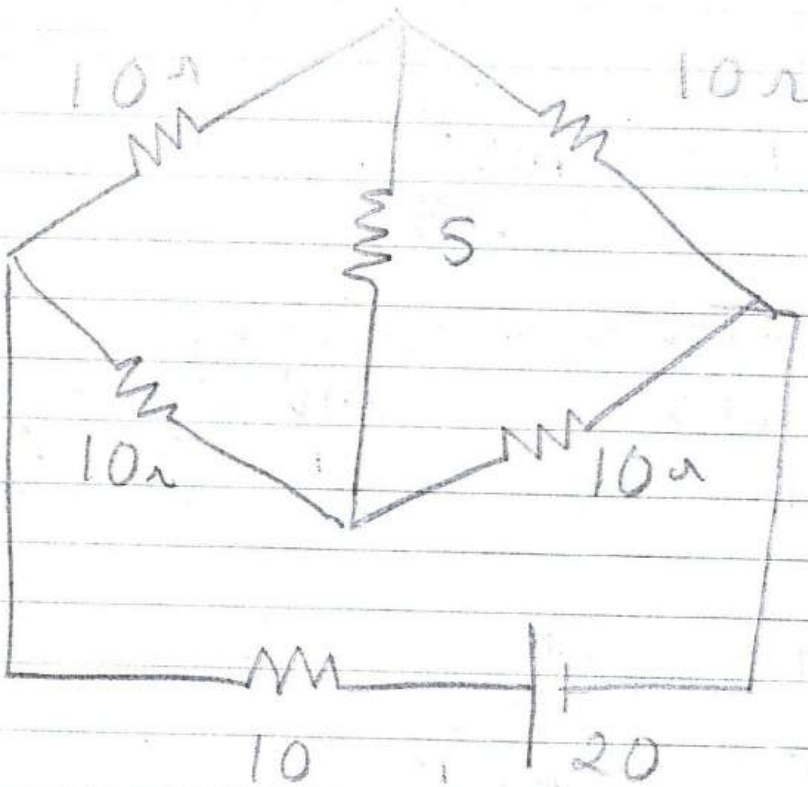
$$\text{Radius} = \frac{mv}{qB}$$ Ans

$$T = \frac{\text{dist}}{v}$$

$$T = \frac{2\pi R}{v}$$

$$T = \frac{2\pi}{v}\left(\frac{mv}{qB}\right)$$

$$T = \frac{2\pi m}{qB}$$



To find = current = ?

we can write the following condition as a condition of balanced wheat stone bridge.

$$\frac{10}{10} = \frac{10}{10} \qquad \text{[True]}$$

Therefore —

PTO

नोट–केन्द्र के नाम की मुहर उत्तरपुस्तिका के किसी भी भाग पर न लगाएं।

नोट–परीक्षार्थी उत्तरपुस्तिका के किसी भी भाग में अपना नाम व केन्द्र का नाम न लिखें।

परीक्षार्थी द्वारा भरा जाय–

अनुक्रमांक (अंकों में)– | | | | | | अनुक्रमांक (शब्दों में) .....

विषय Physics प्रश्नपत्र संकेतांक– 429 (IFE)

कक्ष निरीक्षक द्वारा भरा जाय–

केन्द्र संख्या– 0 8 3 6

परीक्षा कक्ष संख्या– 1 7

(उपरोक्त सभी प्रविष्टियों की जाँच मेरे द्वारा सावधानीपूर्वक कर ली गई है।)

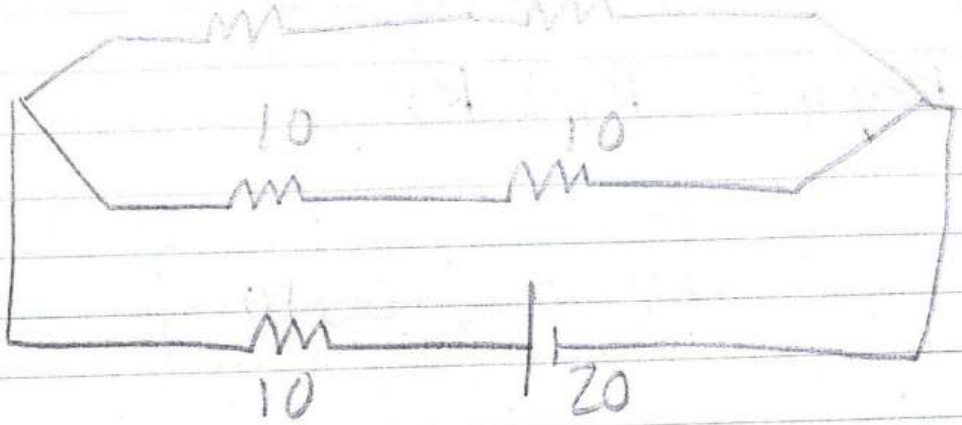
कक्ष निरीक्षक का नाम GEETA VERMA

दिनांक– 07-03-2024

हस्ताक्षर कक्ष निरीक्षक– 07-03-2024

परीक्षक के हस्ताक्षर व संख्या .....

पी0एस0यू0 (आर0ई0) 17 उ0वि0शि0प0/36–14–06–2023–2,11,000 उत्तर पुस्तिकाएं (कम्प्यूटर/ऑफसेट)।



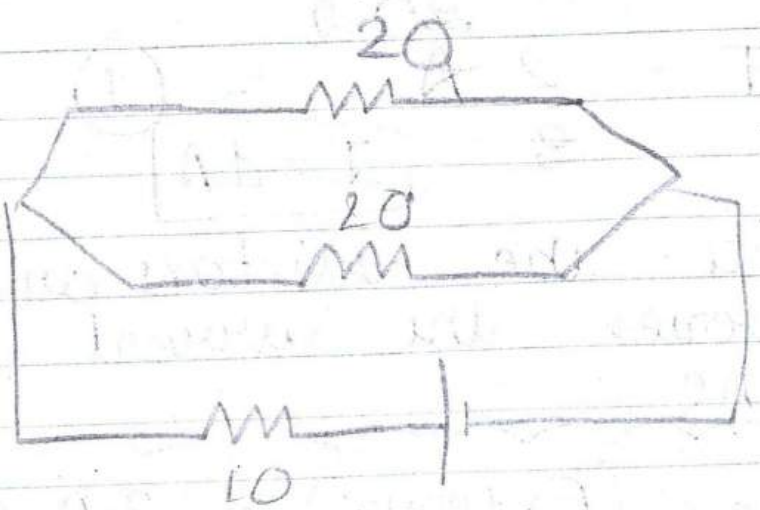
$Req_1 = 10 + 10 = \underline{20\Omega}$

$Req_2 = 10 + 10 = \underline{20\Omega}$

Series combination

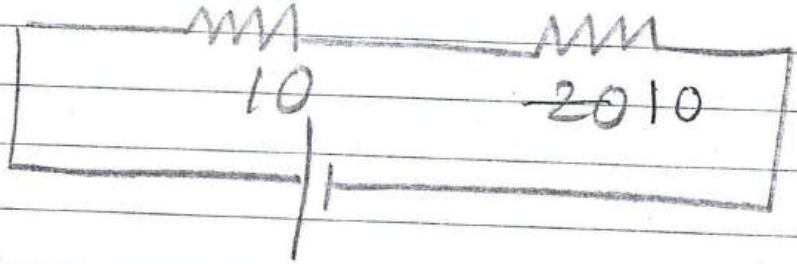
$Req = R_1 + R_2$

$1/Req_3 = \frac{1}{R_1} + \frac{1}{R_2}$



$Req_3 = 10\Omega$

$Req_4 = R_1 + R_2$



$Req_4 = 20 + 10$

$\boxed{Req_4 = 30\Omega}$

We know that

$$I = \frac{V}{R}$$

$$I_T = \frac{20V}{30\Omega}$$

$$I = \frac{2A}{3} \quad \text{— (1)}$$

$$\boxed{I = 1A}$$

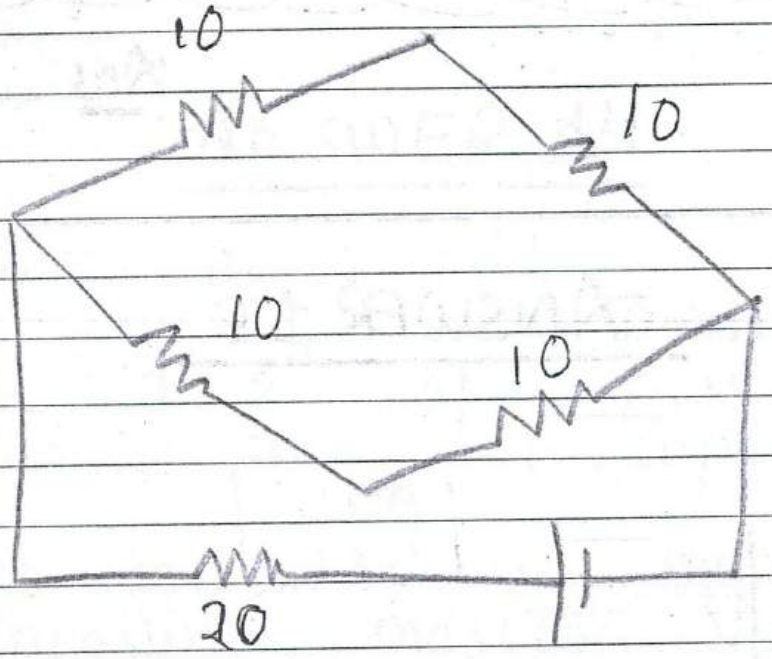
Since the resistors are in series the current will be same.

$$I_{10\Omega}\ (External) = \frac{3A}{3} = 1A$$

$$I_{10\Omega} = \frac{I}{3}$$

Since In parallel combination I is different & V is same -

I



I will be divided is 2 equal halfs due its symmetry -

$$R_{10\Omega} = \frac{3}{6}A = \frac{1}{2}A$$

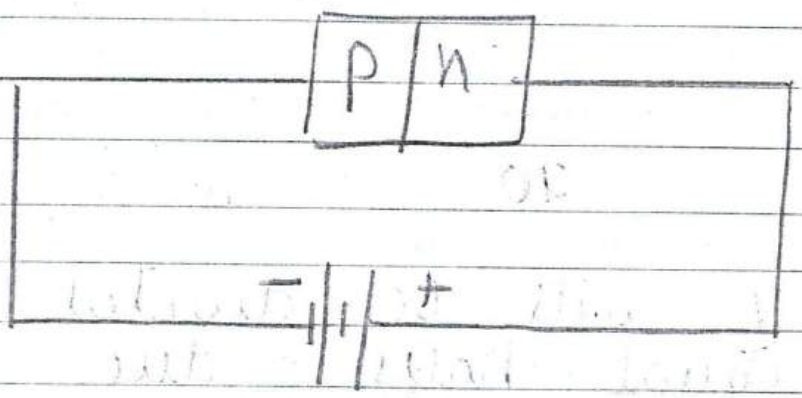
$$R_{10\Omega} = \frac{1}{2}A$$

I_{ion} (each in wheat ston bridge)

$$= \frac{1A}{3-1} = \frac{1A}{2}$$

Ans Ans

ANSWER 15



→ This type of biasing is reverse biasing because p terminal is connected to negative terminal of battery.

(ii) The width of depletion layer increases due to accumulation of charge particles.

ANSWER 14

(i) Atomic mass unit = Atomic mass unit is $1/12^{th}$ of mass of Carbon -12 isotope.

- It is taken as refrance its measure masses of different elements.

$$1\ amu = 1.67 \times 10^{-27}\ kg$$

(ii) It is measured by spectrometer.

ANSWER 13

To show = $\lambda_{EMW} = \lambda_{debroglie}$.

$\Rightarrow \quad \lambda = \frac{h}{mv} = \frac{h}{p}$ — (1)

[De broglie wavelength]

$E = \frac{hc}{\lambda}$

$\Rightarrow \quad \lambda = \frac{hc}{E}$ [λ of EMW]

We know that —

$E = mc^2$

$m = \frac{h}{\lambda v}$ [by (1)]

$\Rightarrow \quad E = \frac{h}{\lambda v} \times c^2$ [$v = c$]

$\Rightarrow \quad E = \frac{hc^2}{\lambda v}$

$E = \frac{hv}{\lambda} \Rightarrow \boxed{\lambda = \frac{hv}{E}}$

Here λ of EMW is equal to de broglie wavelength.

OR -

$$E = mc^2 = \frac{hc}{\lambda}$$

$$\lambda = \frac{hc}{mc^2}$$

$$\lambda = \frac{h}{mc}$$

$$\boxed{\lambda = \frac{h}{p}} \longrightarrow \text{wavelength (Debroglie)}$$

ANSWER 12.

	Interferance	Singly slit diffraction
1).	all the bright fringes are equally bright & dark fringes are equally dark.	The fringes shows irregular brightness & darkness.

PTO

2)	Interferance pattern is due to interference of two or more waves.	Diffraction is due to bend of light & have only one wave.
3)	In Interferance there is superposition of two waves.	There is only one wave in diffraction pattern.

ANSWER 11

- Displacement current - The current which is produced by changing electric feild & forms magnetic Feild is called Displacement current.

PTO

pto

केन्द्र संख्या की मुहर	केन्द्र व्यवस्थापक के हस्ताक्षर	नोट–परीक्षार्थी उत्तरपुस्तिका के किसी भी भाग में अपना नाम व केन्द्र का नाम न लिखें।
0836		
नोट–केन्द्र के नाम की मुहर उत्तरपुस्तिका के किसी भी भाग पर न लगाएं।		

परीक्षार्थी द्वारा भरा जाय–

अनुक्रमांक (अंकों में)– अनुक्रमांक (शब्दों में)

विषय Physics प्रश्नपत्र संकेतांक– 429(IFE)

कक्ष निरीक्षक द्वारा भरा जाय–

केन्द्र संख्या– 0 8 3 6

परीक्षा कक्ष संख्या– 1 7

(उपरोक्त सभी प्रविष्टियों की जाँच मेरे द्वारा सावधानीपूर्वक कर ली गई है।)

कक्ष निरीक्षक का नाम R C Fulsoria

दिनांक– 07.03.24

हस्ताक्षर कक्ष निरीक्षक–

परीक्षक के हस्ताक्षर व संख्या 538

पी0एस0यू0 (आर0ई0) 17 उ0वि0शि0प0/36–14–06–2023–2,11,000 उत्तर पुस्तिकाएं (कम्प्यूटर/ऑफसेट)।

(ii) → $I_d = \varepsilon_0 \frac{d\Phi_E}{dt}$ ⇒ (11). Ans II

Note :- $\mu_0 (I_c + I_d) = \oint B.dl$

ANSWER 10

Given = $\Delta I = 5A$

$t = 0.1s$

$emf = 200V$

To find = $L = ?$

$\Rightarrow emf = -L \frac{dI}{dt}$

$\Rightarrow emf = -L \frac{\Delta I}{\Delta t}$

$\Rightarrow L = \frac{emf \times t}{I}$

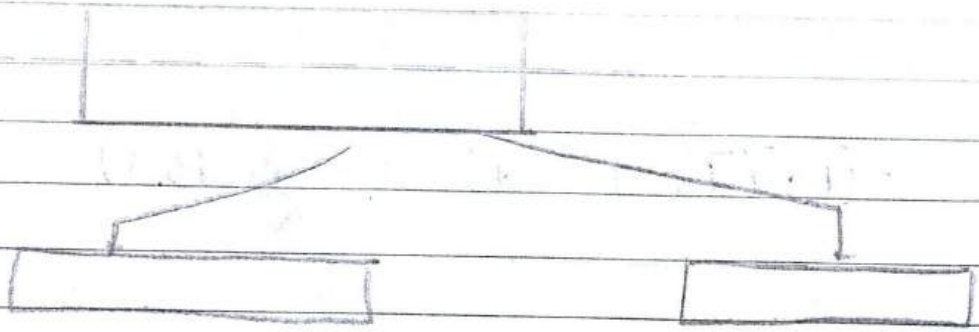
$\Rightarrow |L| = \frac{200 \times 0.1}{5}$

$\Rightarrow L = \frac{20}{5} H$

L = 4 Henry

Ans

(i)



length = same

Area = $\frac{A}{2}$

$M = q_m \times 2l$ [q_m = pole strength]

$M_1 = q_m \times 2l$

$M_2 = \frac{q_m}{2} \times 2l$

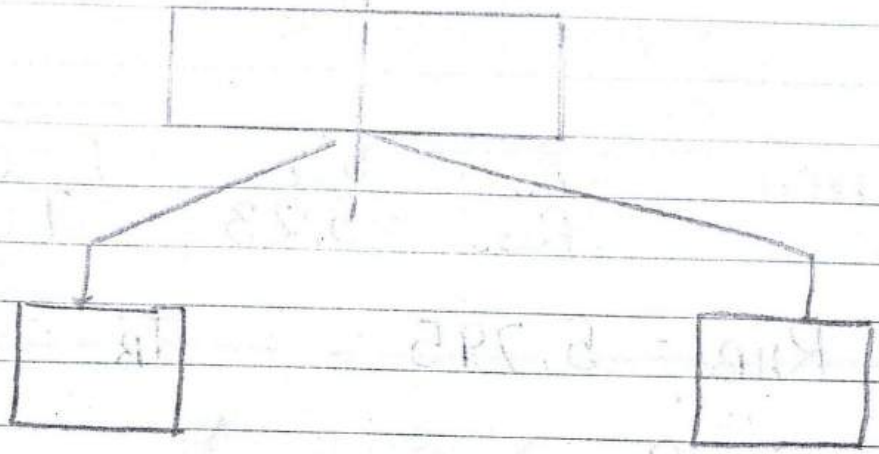
[because pole strength is proportional to Area]

$\Rightarrow$ $M' = \frac{M}{2}$ $q_m' = \frac{q_m}{2}$

magnetic dipole moment

→ Therefore on cutting a magnet length wise its dipole moment & pole strength becomes half.

(ii)



⇒ length = $l/2$
Area = same

⇒ pole strength will remain same but –

$M = q_m \times 2l$

$M' = q_m \times l$

⇒ $M' = \frac{M}{2}$ — $q_m = q_m$

Therefore on cutting a magnet transverse to its length its pole strength remains same but magnetic dipole becomes half!

Given = $R_0 = 5\Omega$ $T = 0°C$

$R_{100} = 5.23$ $T = 100°C$

$R_{HB} = 5.795$ $T_B = ?$

$$\alpha = \frac{R_{100} - R_0}{R_0 (T_2 - T_1)}$$

$$\alpha = \frac{5.23 - 5}{5 (100 - 0)}$$

$$\alpha = \frac{0.23}{500}$$

$$\alpha = \frac{0.23}{5 \times 10^2} = \frac{0.23 \times 10^{-2}}{5}$$

$$\alpha = \frac{23 \times 10^{-4}}{5} = \underline{4.6 \times 10^{-4}}$$

$$\Rightarrow \alpha = \frac{R_B - R_0}{R_0 (T_B - T_0)}$$

$$\alpha = \frac{5.795 - 5}{5 (T_B)}$$

$$4.6 \times 10^{-4} = \frac{0.795}{5 \times T_B}$$

$$T_B = \frac{0.795}{5 \times 4.6 \times 10^{-4}}$$

$$T_B = \frac{2450}{4.6 \times 5} = \frac{2450}{23}\ ^\circ C$$

$$\boxed{T_B \approx 345.8\ ^\circ C}$$ Ans

ANSWER 07

Given - $C = 900\ pF$

$V = 100\ V$

To find = $U = ?$

$$U = \frac{1}{2} CV^2$$

$$U = \frac{1}{2} \times 900 \times 10^{-12} \times 10000$$

$$U = 450 \times 10^{-8}$$

$$\boxed{U = 4.5 \times 10^{-6}\ J}$$ Ans

Note $(1\ pF = 10^{-12}\ F)$

ANSWER 06

Given = $d = 2,4$

$r = 1,2\ m$

$\sigma = 80\ \mu C/m^2$

To find = $q = ?$

$$\boxed{\sigma = \frac{q}{A}} \Rightarrow q = \sigma A$$

$A = 4\pi R^2$

$A = 4\pi(1.44) = 5.76\pi$ — (1)

$q = 80 \times 10^{-6} \times 5.76\pi$

$q = 8 \times 576\pi \times 10^{-7}$

$q = 4608\pi \times 10^{-7}$

$q = 460.8 \times \frac{22}{7} \times \mu C$

$$\boxed{q \approx 1444\ \mu C}$$ (approx)

Ans

ANSWER 05

→ Intrinsic Semiconductor
(Pure Semiconductor)

ANSWER 04

$700nm > \lambda > 400nm$

ANSWER 03

$$\vec{B} = \frac{\mu_0}{4\pi} \frac{I\vec{dl} \times \vec{r}}{r^3}$$

$$\vec{B} = \frac{\mu_0}{4\pi} \frac{Idl \times \hat{r}}{r^3}$$

ANSWER 02

Electric potential