कुल पृष्ठ संख्या–32 (कवर पेज सहित)

क्रम संख्या....

3376955

माध्यमिक शिक्षा बोर्ड, राजस्थान, अजमेर

उच्च माध्यमिक परीक्षा

(परीक्षार्थी द्वारा स्वयं भरा जाना चाहिये)

Candidate's Roll No. In English

(In Figures)

(In Words) :

परीक्षार्थी का नामांक हिन्दी में

शब्दों में :

नोट :– परीक्षार्थी उपरोक्त के अतिरिक्त उत्तर पुस्तिका के अन्य किसी भी भाग में अपना नामांक नहीं लिखे।

माध्यम – हिन्दी ☐ अंग्रेजी ☑

विषय Physics

परीक्षा का दिन Friday

दिनांक 13-03-2020

नोट :– परीक्षार्थी के लिए आवश्यक निर्देश इस पृष्ठ के पिछले भाग पर उल्लेखित हैं। जिन्हें सावधानी पूर्वक पढ़ लें व पालना अवश्य करें।

परीक्षक हेतु निर्देश :– (1) परीक्षक को उपरोक्त सारणी अनुसार प्राप्तांक भरना अनिवार्य हैं, अन्यथा नियमानुसार दंडित किया जायेगा।

(2) परीक्षक उत्तर पुस्तिका के अन्दर के पृष्ठों के बायीं ओर निर्धारित कॉलम में लाल इंक से अंक प्रदत्त करें।

(3) कुल योग भिन्न में प्राप्त होने पर उसे पूर्णांक में ही परिवर्तित कर अंकित करें (उदारणार्थ : 15 ¼ को 16, 17 ½ को 18, 19 ¾ को 20)

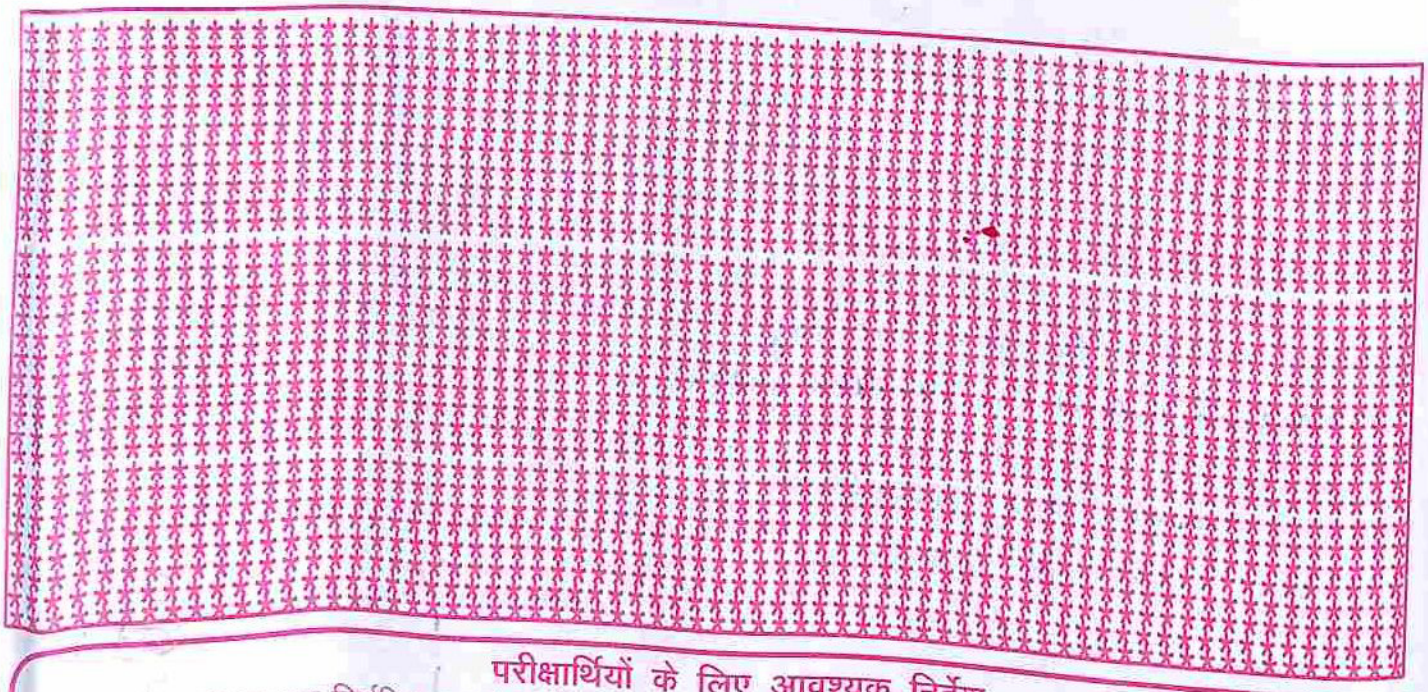
प्रश्नवार प्राप्तांकों की सारणी (परीक्षक के उपयोग हेतु)

प्रश्नों की क्रम संख्या	प्राप्तांक	प्रश्नों की क्रम संख्या	प्राप्तांक
1		19	
2		20	
3		21	
4		22	
5		23	
6		24	
7		25	
8		26	
9		27	
10		28	
11		29	
12		30	
13		31	
14		योग	
15		प्राप्त अंकों का कुल योग (Round off)	
16		अंकों में	शब्दों में
17			
18			

परीक्षक के हस्ताक्षर

संकेतांक

प्रमाणित किया जाता है कि इस उत्तर पुस्तिका के निर्माण में 58 जी.एस.एम. क्रीमवोव कागज ही उपयोग में लिया गया है। 167/2020



परीक्षार्थियों के लिए आवश्यक निर्देश

1. समस्त प्रश्नों का हल निर्धारित शब्द सीमा में इसी उत्तर पुस्तिका में करना है। विशेष परिस्थिति में अतिरिक्त उत्तर पुस्तिका पृथक से उत्तर पुस्तिका भरी हुई होने पर पर्यवेक्षक एवं वीक्षक की अनुशंषा पर ही उपलब्ध कराई जायेगी।
2. प्रश्न–पत्र पर निर्धारित स्थान पर अपना नामांक लिखें।
3. प्रश्न–पत्र हल करने के पश्चात् जिस पृष्ठ पर हल समाप्त होता है, उस पर अन्त में "समाप्त" लिखकर अन्त के सभी रिक्त पृष्ठों को तिरछी लाईन से काटें।
4. निम्न बातों का विशेष ध्यान रखें अन्यथा अनुचित साधनों की रोकथाम अधिनियम के तहत कार्यवाही की जा सकेगी।
   (i) उत्तर पुस्तिका के ऊपर/अन्दर तथा प्रश्नोत्तर के किसी भी भाग में चाही गई सूचना के अलावा अपना नामांक, नाम, पता, फोन नम्बर अथवा पहचान की कोई अन्य प्रकार की सूचना आदि अंकित नहीं करें अन्यथा "अनुचित साधनों के प्रयोग" के अन्तर्गत कार्यवाही की जावेगी।
   (ii) उत्तर पुस्तिका के पृष्ठों को फाड़ें नहीं। उत्तर–पुस्तिका के मुख पृष्ठ पर अंकित संख्या के अनुसार पृष्ठ पूरे होने चाहिये। परीक्षार्थी उत्तरपुस्तिका प्राप्त करते ही पृष्ठ संख्या की जांच कर लें यदि पृष्ठ कम/अधिक या क्रम में नहीं हैं तो वीक्षक से तुरन्त बदलवा लें।
   (iii) परीक्षा केन्द्रों पर पुस्तक, लेख, कागज, केलक्यूलेटर, मोबाईल, पेजर आदि किसी भी प्रकार का इलेक्ट्रोनिक उपकरण तथा किसी भी प्रकार का हथियार आदि ले जाना निषेध हैं।
   (iv) वस्त्र, स्केल, ज्योमेट्री बॉक्स पर कुछ न लिखकर लावें। टेबुल के आस–पास कोई अवैध सामग्री नहीं होनी चाहिये, इसकी जांच कर लें।
   (v) अपनी उत्तर पुस्तिका/ग्राफ/मानचित्र आदि परीक्षा भवन से बाहर ले जाना दण्डनीय अपराध है, अतः परीक्षा समाप्ति पर उत्तर पुस्तिका वीक्षक को बिना सौंपे परीक्षा कक्ष नहीं छोड़ें।
5. उत्तरों को क्रमानुसार एक ही स्थान पर लिखें। प्रश्न क्रमांक भी सही अंकित करें, अन्यथा दण्ड स्वरूप परीक्षक को 1 अंक कम करने का अधिकार है। बीच में उत्तर पुस्तिका के पृष्ठ रिक्त न छोड़ें। गणित विषय के लिए रफ कार्य उत्तर पुस्तिका के अंतिम पृष्ठों पर करें तथा तिरछी रेखा से काटें।
6. जहाँ तक हो सके प्रश्न के सभी भाग के उत्तर, उत्तर पुस्तिका में एक ही स्थान पर अंकित करें।
7. भाषा विषयों को छोड़कर शेष सभी विषयों के प्रश्न–पत्र हिन्दी–अंग्रेजी दोनों भाषा में मुद्रित है। किसी भी प्रकार की त्रुटि/अन्तर/विरोधाभास होने पर हिन्दी भाषा के प्रश्न को ही सही माना जाये।

द्वारा अंक	प्रश्न संख्या	परीक्षार्थी उत्तर

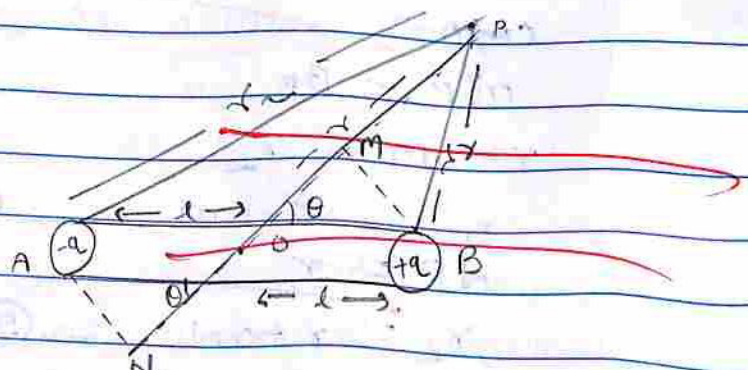
Section - D

28. Electric potential :-

Electric potential is defined as the amount of work done in bringing a unit positive test charge from infinite to that point against electrostatic force along any path.

$$V_{AB} = \frac{W_{AB}}{q_0}$$

Electric potential at position (r, θ) due to dipole -



Let us consider an electric dipole consisting two charges $+q$ and $-q$. Electric potential is to be determined at point P (OP = r). Point P is situated at θ angle and r_1 distance from q and r_2 distance from $-q$.

Potential due to $+q$ charge -

परीक्षक द्वारा प्रदत्त अंक | प्रश्न संख्या

परीक्षार्थी उत्तर

$$V_1 = \frac{kq}{r_1} \quad \text{---- (1)}$$

similarly potential due to -q charge -

$$V_2 = \frac{-kq}{r_2} \quad \text{---- (2)}$$

Total potential at point P -

$$V = V_1 + V_2$$

From eq. (1) and (2)

$$V = \frac{kq}{r_1} - \frac{kq}{r_2}$$

$$V = kq\left(\frac{r_2 - r_1}{r_1 r_2}\right) \quad \text{---- (3)}$$

To determine r_1 and r_2 we drawn normals BM ⊥ OP and AN ⊥ OP.

In $\triangle OBM$ -

$MP \cong BP$

$r - OM \cong r_2$

$r_1 = r - OM$ — (4)

$NP \cong r_2$

$r_2 = r + ON$ — (5)

In $\triangle OBM$

$$\cos\theta = \frac{OM}{l}$$

$$OM = l\cos\theta \quad \text{— (6)}$$

similarly in $\triangle OAN$

$$\cos\theta = \frac{ON}{l}$$

BSR 16/2020

$ON = l\cos\theta$ ... (7)

From equation (4) and (6)

$r_1 = r - l\cos\theta$

From equation (5) and (7)

$r_2 = r + l\cos\theta$

putting r_1, r_2 in equation (3)

$$V = Kq\left(\frac{r + l\cos\theta - r + l\cos\theta}{(r + l^2\cos^2\theta)(r - l\cos\theta)}\right)$$

$$V = \frac{Kq \times 2l\cos\theta}{r^2 - l^2\cos^2\theta}$$

$\because r \gg l$

$\therefore r^2 \gg l^2\cos^2\theta$

$$\boxed{V = \frac{KP\cos\theta}{r^2}} \quad (\because P = q \times 2l)$$

Case I) at axial position -

$\theta = 0°$

$$V = \frac{Kq}{r^2}$$

Case II) at equitorial position.

$\theta = 90°$

$V = 0$ $(\because \cos 90° = 0)$

परीक्षक द्वारा प्रदत्त अंक | प्रश्न संख्या | परीक्षार्थी उत्तर

29. Suspended coil galvanometer -

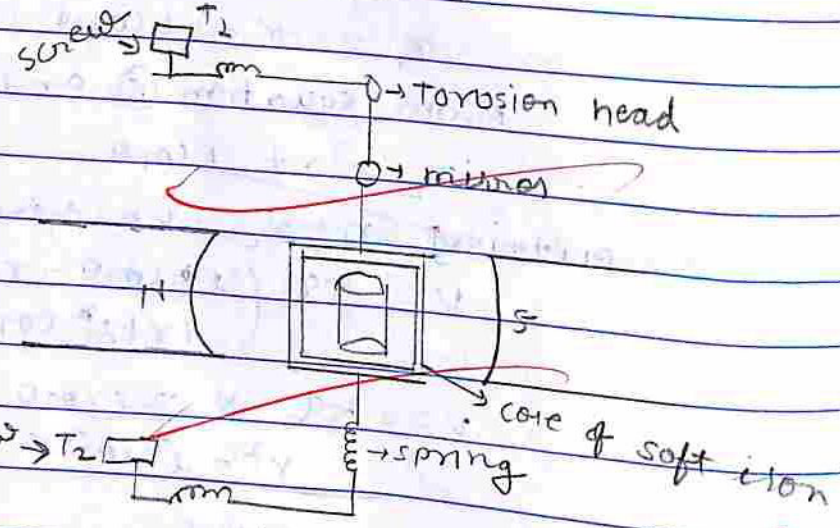


Fig. Suspended coil galvanometer

construction -

In the above figure a suspended coil galvanometer is shown. In this, there is a leminated core of soft iron on which thick copper wires are wounded. This coil is suspended on a torsion head so that it can rotate freely. The spring is so attached on other side which gensates restoring torque. At the end of wire a mirror is attached. The rotation of this mirror occurs with coil. This is measured by lamp and scale arrangement. At the both sides two screws are connected through which it is connected in external circuit. Concave shape magnets are used to

provide radial magnetic field.

Principle -

It works on the principle that if any coil is free to rotate in magnetic field then it will rotate on flowing current due to torque produced in it.

$\tau_1 = MB \sin\theta$

$\tau_1 = NIAB \sin\theta$

$\theta = 90°$ (∵ radial magnetic field)

$\tau_1 = NIAB$ — (1)

Due to rotation a twist develops and torque is also developed.

$\tau_2 = C\phi$ — (2)

ϕ = twist or deflection in coil

In balancing condition -

$\tau_1 = \tau_2$

$NIAB = C\phi$

$I = \frac{C}{NAB}\phi$

$I = K\phi$ K = constant

$I \propto \phi$

So current is proportional to deflection produced in coil.

परीक्षक द्वारा प्रदत्त अंक | प्रश्न संख्या | परीक्षार्थी उत्तर

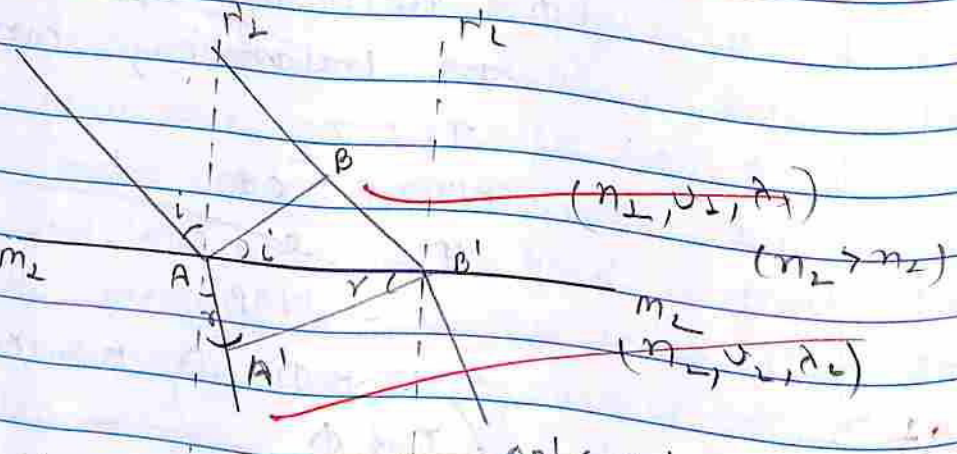
30. Wavefront -

Wavefront is defined as the continuous locus of all the points which are at equal distance from light source and vibrating in same phase.

Nature of wavefront depends upon the size of source and distance from source.

ex - (i) spherical wavefront
(ii) cylinderical wavefront
(iii) plane wavefront

Explanation of refraction on basis of Huygens wave theory -



According to figure $m_1 m_2$ is the surface separating two mediums with refractive index n_1 and n_2. AB is the incident wavefront. medium II is denser medium. The disturbance from A touches the surface but B travels a distance $v_1 t$ in first medium.

द्वारा अंक | प्रश्न संख्या | परीक्षार्थी उत्तर

In same time disturbance from point A travels $v_2 t$ ($v_2 t < v_1 t$) in second medium.

To determine the shape of wavefront we draw an arc of radius $v_2 t$ in second medium and draw tangent. A'B' is refracted wavefront.

First law of reflection is satisfied because from the diagram (i) incident ray, refracted ray and normal are in same plane.

(ii) For second law -

in $\triangle ABB'$ -

$$\sin i = \frac{BB'}{AB'}$$

$\because BB' = v_1 t$

$$\sin i = \frac{v_1 t}{AB'} \quad \text{— (1)}$$

$$\sin r = \frac{AA'}{AB'} \quad (\text{In } \triangle AA'B')$$

$$\sin r = \frac{v_2 t}{AB'} \quad \text{— (2)}$$

dividing eqn (1) by (2)

$$\frac{\sin i}{\sin r} = \frac{\frac{v_1 t}{AB'}}{\frac{v_2 t}{AB'}}$$

$$\frac{\sin i}{\sin r} = \frac{v_1}{v_2} \quad \text{— (3)}$$

परीक्षक द्वारा प्रदत्त अंक | प्रश्न संख्या | परीक्षार्थी उत्तर

∵ we know that

$$\frac{v_1}{v_2} = \frac{n_2}{n_1}$$

so $\boxed{\frac{\sin i}{\sin r} = \frac{n_2}{n_1} = n_{21}}$

This is Snell's law for refraction

we know that frequency is same for both medii -

$$v_1 = v_2$$

$$\frac{v_1}{n_1} = \frac{v_2}{n_2}$$

$$\frac{v_1}{v_2} = \frac{n_1}{n_2}$$

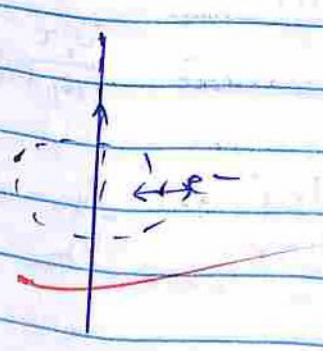
$$\frac{v_1}{v_2} = \frac{n_1}{n_2} = \frac{n_2}{n_1}$$

section 'B'

14. Diameter = 0.30 metre

radius = $\frac{0.30}{2}$ $\lambda = 10^{-6}$ C/m

$r = 0.15$ metre



द्वारा अंक | प्रश्न संख्या | परीक्षार्थी उत्तर

In this condition centripetal force to electron is provided by electric field.

$$E = \frac{2Kd}{r}$$

Force on electron -

$$F_e = qE$$

$$= e \times \frac{2Kd}{r}$$

$$\therefore F_c = F_e$$

$$\frac{mv^2}{r} = \frac{e \times 2Kd}{r}$$

$$v^2 = \frac{2KAe}{m}$$

$$= 2 \times \frac{9 \times 10^9 \times 10^{-6} \times 1.6 \times 10^{-19}}{9 \times 10^{-31}}$$

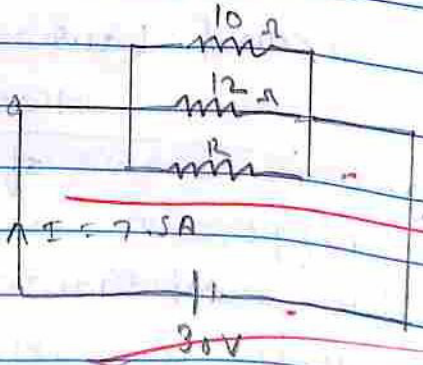
$$v^2 = 3.2 \times 10^{15}$$

$$v = \sqrt{3.2 \times 10^{15}}$$

$$= \sqrt{32} \times 10^7 \text{ m/s}$$

$$v = 5.47 \times 10^7 \text{ m/s}$$

15.



परीक्षक द्वारा प्रदत्त अंक | प्रश्न संख्या | परीक्षार्थी उत्तर

Equivalent resistance -

$$R_{eq} = \frac{V}{I}$$

$$= \frac{30}{7.5}$$

$$R_{eq} = 4\ \Omega$$

$$\therefore \frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

$$\frac{1}{4} = \frac{1}{R} + \frac{1}{12} + \frac{1}{10}$$

$$\frac{1}{R} = \frac{1}{4} - \frac{1}{12} - \frac{1}{10}$$

$$= \frac{15 - 5 - 6}{60}$$

$$\frac{1}{R} = \frac{4}{60}$$

$$R = \frac{60}{4}$$

$$R = 15\ \Omega$$

16. (a) Kirchoff's second law -

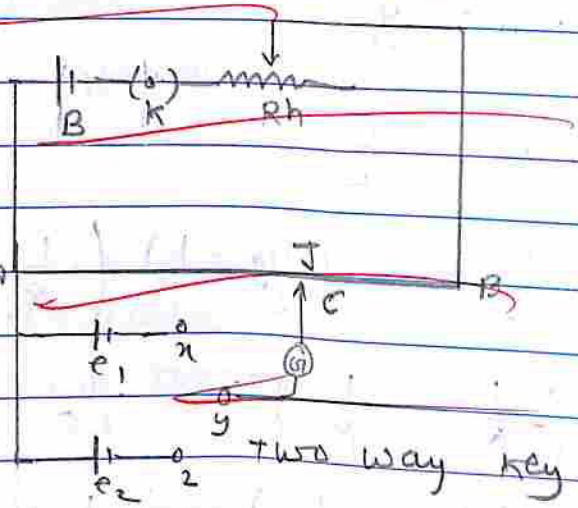
According to this law the algebric sum of product of current in different branches and their respective resistances is equal to the algebric sum of emf of all batteries.

प्रश्न संख्या

परीक्षार्थी उत्तर

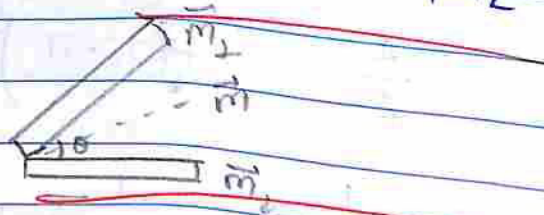
i.e. $\sum_{i=1}^{n} I_i R_i = \sum_{i=1}^{n} e_i$

(b)



(17) (a) Resultant magnetic moment of $\vec{m}_1$ and $\vec{m}_2$ -

$$m = \sqrt{m_1^2 + m_2^2 + 2m_1 m_2 \cos\theta}$$



(b) Soft iron is used in making electromagnets because -

(i) It's coercivity is less so its magnetism can be destroyed easily

(ii) It's B-H curve area is less so losses are also less.

(iii) Magnetism is not affected by heat.

परीक्षक द्वारा प्रदत्त अंक | प्रश्न संख्या | परीक्षार्थी उत्तर

18.

$f = 25\ cm$

$n_w = \frac{4}{3}$

$n_g = \frac{3}{2}$

$$\frac{1}{f} = (n_g - 1)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$$

$$\left(\frac{3}{2} - 1\right)\left(\frac{1}{R_1} - \frac{1}{R_2}\right) = \frac{1}{25}$$

$$\left(\frac{1}{R_1} - \frac{1}{R_2}\right) = \frac{1}{25} \times 2 \quad \text{— (1)}$$

$$\frac{1}{f_l} = \left(\frac{n_g}{n_w} - 1\right)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$$

$$\frac{1}{f_l} = \left(\frac{3/2}{4/3} - 1\right) \times \frac{2}{25}$$

$$\frac{1}{f_l} = \left(\frac{9}{8} - 1\right) \times \frac{2}{25}$$

$$\frac{1}{f_l} = \frac{1}{84} \times \frac{2}{25}$$

$$\frac{1}{f_l} = \frac{1}{100}$$

$$f_l = 100\ cm$$

BSFR-167/2020

प्रश्न संख्या | परीक्षार्थी उत्तर

19.

Interference	Diffraction
(i) The fringe width of all the fringes is same.	(i) Fringe width of all fringes is not same. Fringe width of central maxima ($\frac{2\lambda}{a}$) is higher than others.
(ii) The intensity of all bright fringes is same	(ii) Intensity of central maxima is maximum and number of fringes is less

(20) Failure of wave theory to explain photo electric effect -

(i) According to wave theory on increasing intensity of wave, amplitude increases and energy stored by wave also increases. But in photoelectric effect energy does not depend upon intensity. It is a function of frequency.

(ii) According to wave theory energy is not transfered to single electron but it is uniformly distributed. So electrons do not get sufficient energy instantly. So there is time lag but in photoelectric effect if energy is more than threshold energy then there is no time lag. (10^{-9} sec)

परीक्षक द्वारा प्रदत्त अंक | प्रश्न संख्या

परीक्षार्थी उत्तर

21. $V = 50 \sin 314t$ volt

$I = 10 \sin\left(314t + \frac{\pi}{4}\right)$ Amp.

$\theta = +\pi/4$ (voltage is lagging)

(i) Wattless current-

$I = \frac{I_m \sin\theta}{\sqrt{2}}$

$I_{wattless} = \frac{10}{\sqrt{2}} \times \sin\left(\frac{\pi}{4}\right)$

$= \frac{10}{\sqrt{2}} \times \frac{1}{\sqrt{2}} =$

$= \frac{10}{2} = 5$ A (negative cycle)

$I_{wattless} = 5$ A (magnitude)

So wattless current is 5A.

(ii) Root mean square voltage-

$V_{rms} = \frac{V_m}{\sqrt{2}}$

$V_{rms} = \frac{50}{\sqrt{2}}$

$= \frac{50}{1.41}$

$V_{rms} = 35.6$ volt

प्रश्न संख्या | परीक्षार्थी उत्तर

22. $^{235}_{92}D \xrightarrow{\alpha} {}^{231}_{90}D_1 \xrightarrow{\beta^-} {}^{231}_{91}D_2 \xrightarrow{\alpha} {}^{227}_{89}D_3$

$\xrightarrow{\gamma} {}^{227}_{89}D_4$

(2) atomic number = 89
mass number (A) = 227
(∵ in α - decay mass number is reduced by 4 and atomic number by 2)

23. Intrinsic semiconductor -

This is the pure semiconductor. In this impurity is not mixed. They have less conductivity.
Ex - Si, Ge (Pure)

Extrinsic semiconductor -

When in any intrinsic semiconductor, small amount of impurity is mixed then its conductivity increases. This is called extrinsic semiconductor.
Ex - (i) Si dopped with P
(ii) Ge dopped with Al

24) $m_1 = 10V$
$m_2 = 2V$

परीक्षक द्वारा प्रदत्त अंक | प्रश्न संख्या | परीक्षार्थी उत्तर

$$\mu = \frac{m_1 - m_2}{m_1 + m_2}$$

$$= \frac{10 - 2}{10 + 2}$$

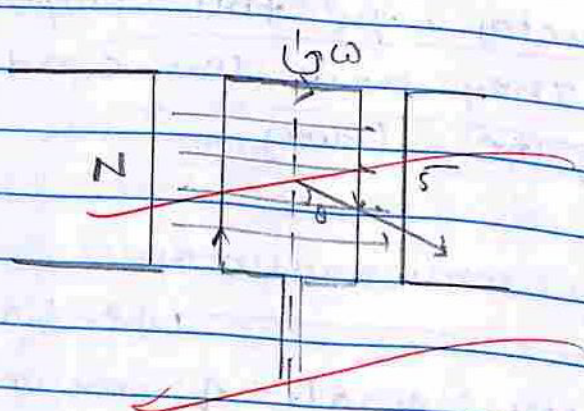
$$= \frac{8}{12}$$

$$\mu = \frac{2}{3}$$

$$\boxed{\mu = 0.66}$$

Section 'C'

25.



Let us consider a rectangular coil is rotating in uniform magnetic field with angular velocity ω. Due to the change in flux emf is induced in it. Let the magnetic field is B and area is A. The number of turns are N.

We know that flux ~

परीक्षक द्वारा प्रदत्त अंक | प्रश्न संख्या | परीक्षार्थी उत्तर

$\Phi = N(\vec{B}.\vec{A})$

$\Phi = NBA\cos\theta$

$\because \omega = \frac{\theta}{t}$

$\theta = \omega t$

$\Phi = NBA\cos\omega t$

We know that -

$e = -\frac{d\Phi}{dt}$ (By Faraday's second law)

$e = -\frac{d(NBA\cos\omega t)}{dt}$

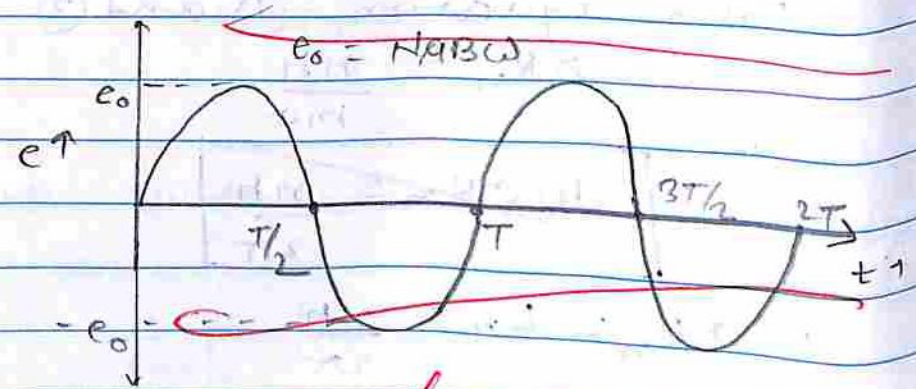
$e = -NBA.\omega(-\sin\omega t)$

$e = NBA\omega\sin\omega t$

$\boxed{e = e_0\sin\omega t}$

$I = \frac{e}{R} = \frac{e_0}{R}\sin\omega t$

Graph between e and t -



परीक्षक द्वारा प्रदत्त अंक | प्रश्न संख्या | परीक्षार्थी उत्तर

26. Explaination of Bohr's second postulate by De-Broglie's hypothesis-

Bohr's second postulate defines stationary orbits. According to De-Broglie the electron revolving around nucleus is in the form of wave. Electron does not radiate energy, so it can not be electromagnetic wave.

For formation of stationary wave -

$$2\pi R_n = n\lambda \quad \text{---} (1)$$

According to De-Broglie theory the wavelength is -

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

$$\lambda = \frac{h}{mv} \quad \text{---} (2)$$

From equation (1) and (2)

$$2\pi R_n = \frac{nh}{mv}$$

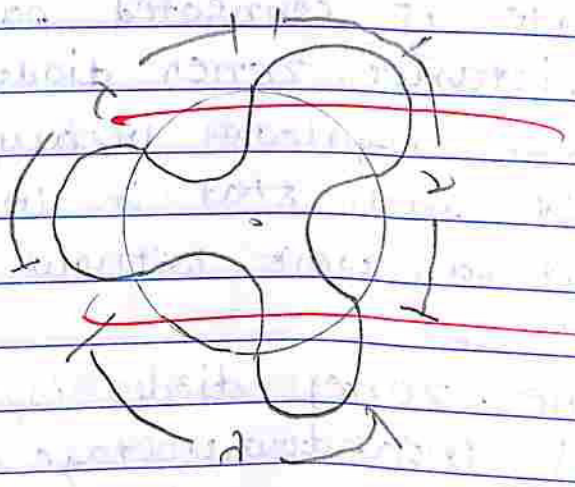
$$\boxed{mvR_n = \frac{nh}{2\pi}}$$

$$mvR_n = L_n = \frac{nh}{2\pi}$$

This is Bohr's second postulate.

प्रश्न संख्या | परीक्षार्थी उत्तर

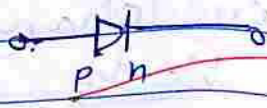
wave model for $n = 3$ –



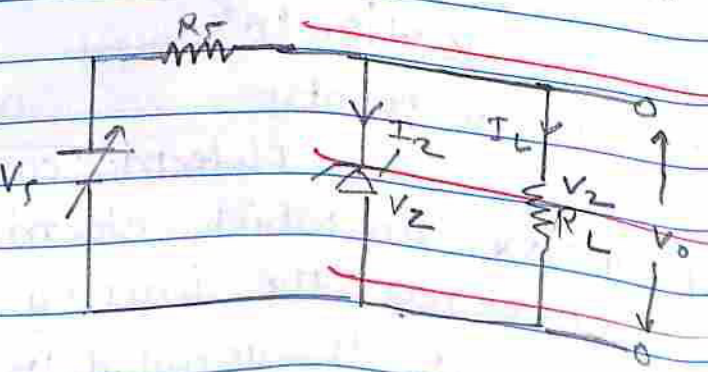
$2\pi R_n = 3\lambda$

27 P-N junction diode –

Diode means 'bi+electrode' when two electrodes are made in p-n junction to connect it in external circuit then it is called p-n junction diode :



zener diode as voltage regulator –



परीक्षक द्वारा प्रदत्त अंक | प्रश्न संख्या | परीक्षार्थी उत्तर

According to the above figure a zener diode is connected parallel to load resistance. Zener diode is used as voltage regulator because it is so formed such that in breakdown region it can work without damaging.

Working :-

The zener diode is so selected that its breakdown voltage is equal to potential to be obtained at load resistance when V_s becomes more than V_z then it comes in breakdown region and works without damaging and voltage V_z remains at its ends. The load resistance is connected in parallel to it so voltage at its ends also remains constant.

R_s is connected in series to control sudden change in current.

$$R_s = \frac{V_s - V_z}{I_L + I_z}$$

Section 'A'

1. Dielectric constant -

Dielectric constant is a property on which electric force depends. It represents the ionising capacity of medium. It is denoted by ε.

प्रश्न संख्या | परीक्षार्थी उत्तर

$\varepsilon_m = \varepsilon_0 \varepsilon_r$

$\varepsilon_r = \frac{\varepsilon_m}{\varepsilon_0}$

$\varepsilon_0 = 8.85 \times 10^{-12} \frac{C^2}{Nm^2}$

2. Generally the resistance drawn box is of wire of unknown resistance. So potential drop across both parts of wire is same. So balancing length is found in middle. ~~and Potential~~

3. (i) Right hand thumb rule
(ii) Ampere's Swimming law (SNOW rule)

4 Diamagnetic substances -

Those substances which are magnetised in opposite direction of magnetic field are called diamagnetic substances. They move from weaker to stronger magnetic field.

Ex - Bi, Hg etc.

परीक्षक द्वारा प्रदत्त अंक | प्रश्न संख्या | परीक्षार्थी उत्तर

5. Magnetic flux -

The number of magnetic field lines passing through an area placed normally in a magnetic field is called magnetic flux.

$\Phi_B = \vec{B} \cdot d\vec{S}$

unit - ~~flux~~ weber

6. Point R is showing resonance stage

7. Scattering of light -

When light rays are incident on atmospheric particles then they are scattered in the same medium in different colours. This is called scattering of light.

8. The main objective of Davisson and Germer experiment was to justify De-Broglie hypothesis. It was related with matter particle then property of diffraction as X-rays is observed.

प्रश्न संख्या	परीक्षार्थी उत्तर

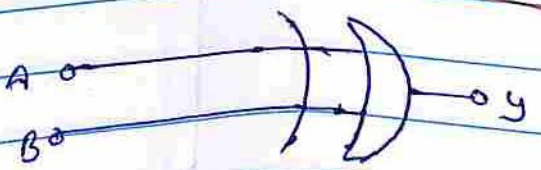
9. Heisenberg's uncestainity principle-

According to this principle the position and momentum of a particle in a disection can not be measured accurately simultaneouly.

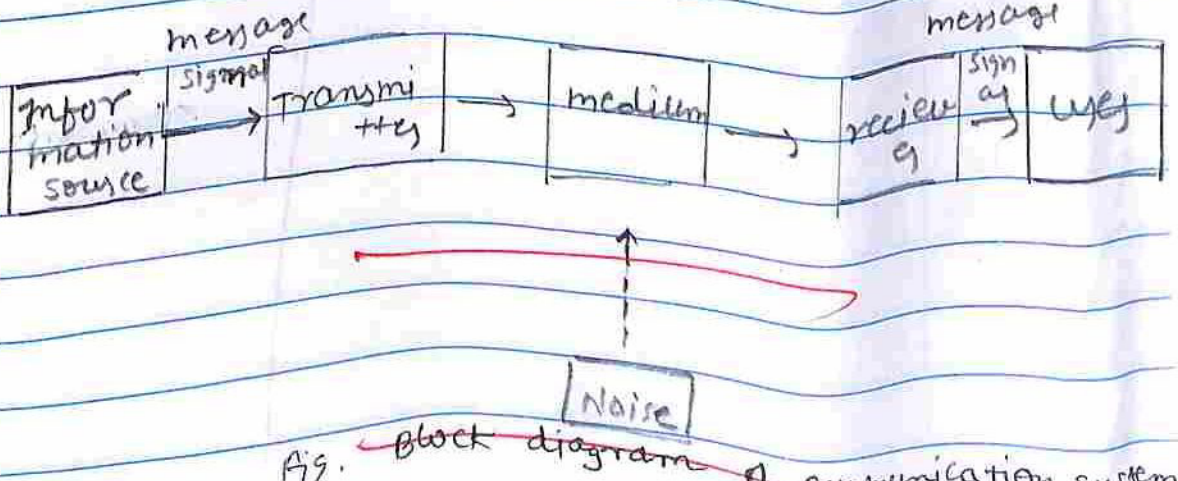
i.e. $\Delta P_x \cdot \Delta x \geq \frac{h}{4\pi}$

10. coolant removes heat from reactor. This heat is used to vaporise water by which turbine is drived and energy is obtained.

11. XOR gate symbol -



12.



Ans. Block diagram of communication system.

परीक्षक द्वारा प्रदत्त अंक | प्रश्न संख्या | परीक्षार्थी उत्तर

13. Nanotechnology —

It is the study of particles of nanometer scale (1nm - 100nm) The ~~func~~ engineering of tailoring functional systems at nanometer scale is called nanotechnology.

समाप्त

द्वारा क	प्रश्न संख्या	परीक्षार्थी उत्तर