26th Feb. 2021 | Shift - 2
PHYSICS

JEE I NEET I Foundation

SECTION – A

1. A tuning fork A of unknown frequency produces 5beats/s with a fork of known frequency 340 HZ. When fork A filed, the beat frequency decreases to 2beats/s. What is the frequency of fork A?

(1) 342 Hz

(2) 335 Hz

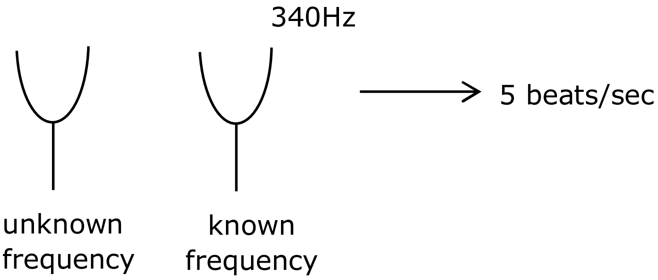
(3) 338 Hz

(4) 345 Hz

Sol. **(2)**

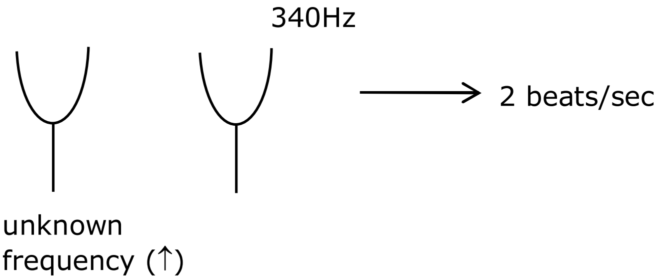
Given

BeforeFiled:



So answer should be 335 Hz or 345 Hz.

After Filed :



$$340 \nearrow 335 \xrightarrow{\text{Filed}} 336, 337, 338 \ldots\ldots\ldots$$

$$340 \searrow 345 \xrightarrow{\text{Filed}} 346, 347, 348 \ldots\ldots\ldots$$

After filed beat/sec decreases only in case of 335 Hz.

2. The trajectory a projectile in a vertical plane is $y = \alpha x - \beta x^2$, where α and β are constants and x & y are respectively the horizontal and vertical distance of the projectile from the point of projection. The angle of projection θ and the maximum height attained H are respectively given by:

(1) $\tan^{-1}\alpha, \dfrac{\alpha^2}{4\beta}$

(2) $\tan^{-1}\beta, \dfrac{\alpha^2}{2\beta}$

(3) $\tan^{-1}\left(\dfrac{\beta}{\alpha}\right), \dfrac{\alpha^2}{\beta}$

(4) $\tan^{-1}\alpha, \dfrac{4\alpha^2}{\beta}$

Sol. **(1)**

Given :

$y = \alpha x - \beta x^2$ ....(1)

for maximum height, we should find out maximum value of y from equation (1)

so, for maximum value of y

$\dfrac{dy}{dx} = 0 \Rightarrow \alpha - 2\beta x = 0$

$x = \dfrac{\alpha}{2\beta}$ ....(2)

Now, put value of x from equation (2) in quation (1)

$y = \alpha\left(\dfrac{\alpha}{2\beta}\right) - \beta\left(\dfrac{\alpha^2}{4\beta^2}\right)$

$\Rightarrow \left(\dfrac{\alpha^2}{2\beta}\right) - \left(\dfrac{\alpha^2}{4\beta}\right) \Rightarrow \dfrac{\alpha^2}{4\beta}$

So, $H_{max} = \dfrac{\alpha^2}{4\beta}$ ....(3)

As we know maximum height $H_{max} = \dfrac{u^2 \sin^2\theta}{2g}$ ...(4)

from (3) and (4) $u^2 = \left(\dfrac{\alpha^2}{4\beta}\right)\left(\dfrac{2g}{\sin^2\theta}\right)$

and range (R) = 2x = $\dfrac{u^2 \times 2\sin\theta\cos\theta}{g}$

$2\left(\dfrac{\alpha}{2\beta}\right) = \dfrac{\left(\dfrac{\alpha^2}{4\beta}\right)\left(\dfrac{2g}{\sin^2\theta}\right) \times 2\sin\theta\cos\theta}{g}$

$\tan\theta = \alpha \Rightarrow \theta = \tan^{-1}(\alpha)$

3. A cord is wound round the circumference of wheel of radius r. The axis of the wheel is horizontal and the moment of inertia about it is I. A weight mg is attached to the cord at the end. The weight falls from rest. After falling through a distance 'h', the square of angular velocity of wheel will be:

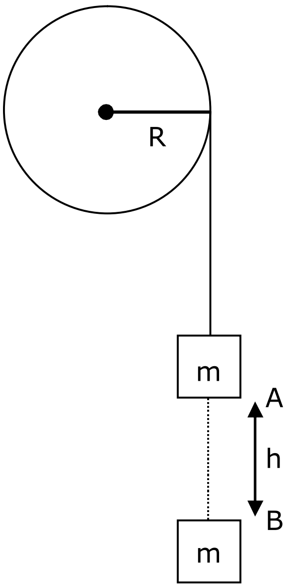
(1) $\frac{2gh}{I+mr^2}$

(2) 2gh

(3) $\frac{2mgh}{I+2mr^2}$

(4) $\frac{2mgh}{I+mr^2}$

Sol. **(4)**



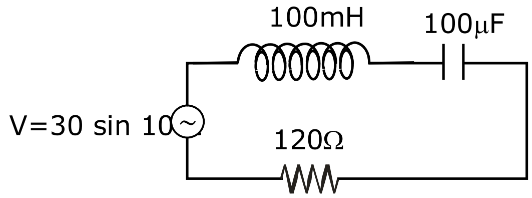
using energy conservation between A and B point

$mgh = \frac{1}{2} m (wR)^2 + \frac{1}{2} I\omega^2$

$2mgh = (MR^2 + I) \omega^2$

$\omega^2 = \frac{2mgh}{I+MR^2}$

4. Find the peak current and resonant frequency of the following circuit (as shown in figure)



(1) 0.2 A and 100 Hz
(2) 2 A and 50 Hz
(3) 2 A and 100 Hz
(4) 0.2 A and 50 Hz

Sol. **(4)**

Peak current in series LCR CKT

$$i = \frac{v_0}{z} \Rightarrow \frac{30}{\sqrt{(x_L - x_C)^2 + R^2}}$$

$$i = \frac{30}{\sqrt{(10-100)^2 + (120)^2}}$$

$$i \Rightarrow \frac{30}{150} \Rightarrow \frac{1}{5} \Rightarrow 0.2Amp.$$

$$\therefore X_L = \omega \times L$$

$\Rightarrow$ (100) (100 × 10^{-3})$\Rightarrow$ 10

$$X_L = \frac{1}{\omega \times c} \Rightarrow \frac{1}{100 \times 100 \times 10^{-6}}$$

$$\Rightarrow \frac{10^6}{10^4} \Rightarrow 100$$

Resonance frequency $\omega = \frac{1}{\sqrt{LC}}$

$$\omega = \frac{1}{\sqrt{100 \times 10^{-3} \times 100 \times 10^{-6}}} \Rightarrow \frac{1}{\sqrt{10^{-5}}}$$

$\therefore \omega$ = 2πF

$$F = \frac{1}{2\pi} \times \frac{1}{\sqrt{10^{-5}}}$$

$$\Rightarrow \frac{1}{2\pi}\sqrt{10^5}$$

$$\Rightarrow \frac{100}{2\pi}\sqrt{10}$$

$\Rightarrow$ 50Hz

5. The incident ray, reflected ray and the outward drawn normal are denoted by the unit vectors $\vec{a}, \vec{b}$ and $\vec{c}$ respectively. Then choose the correct relation for these vectors.

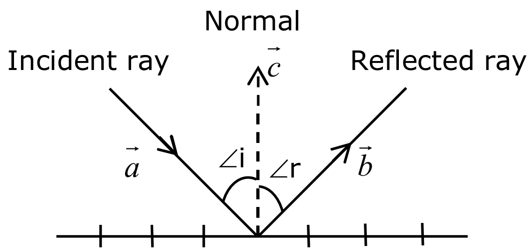
(1) $\vec{b} = 2\vec{a} + \vec{c}$

(2) $\vec{b} = \vec{a} - \vec{c}$

(3) $\vec{b} = \vec{a} + 2\vec{c}$

(4) $\vec{b} = \vec{a} - 2\left(\vec{a} \cdot \vec{c}\right)\vec{c}$

Sol. **(4)**



We see from the diagram that because of the law of reflection, the component of the unit vector $\vec{a}$ along $\vec{b}$ changes sign on reflection while the component parallel to the mirror remain unchanges.

$\vec{a} = \overrightarrow{a_{11}} + \overrightarrow{a_{\perp}}$

and $\overrightarrow{a_{\perp}} = \vec{c}\left(\vec{a}.\vec{c}\right)$

we see that the reflected unit vector is

$\vec{b} = \overrightarrow{a_{11}} - \overrightarrow{a_{\perp}} \Rightarrow \vec{a} - 2(\vec{a} \cdot \vec{c})\vec{c}$

6. A radioactive sample is undergoing α decay. At any time t_1, its activity is A and another time t_2, the activity is $\frac{A}{5}$. What is the average life time for the sample?

(1) $\frac{t_2 - t_1}{\ln 5}$

(2) $\frac{\ln(t_2 + t_1)}{2}$

(3) $\frac{t_1 - t_2}{\ln 5}$

(4) $\frac{\ln 5}{t_2 - t_1}$

Sol. **(1)**

For activity of radioactivesample

$A = A_0 e^{-\alpha t_1}$ ....(1)

$\frac{A}{5}$ $A_0 e^{-\alpha t_2}$ ....(2)

From (1)/(2)

$5 = e^{-\lambda(t_1 - t_2)}$

$\ln(5) = (t_2 - t_1)\,\lambda \Rightarrow \lambda = \frac{\ln(5)}{t_2 - t_1}$

avg. life $= \frac{1}{\lambda} \Rightarrow \frac{t_2 - t_1}{\ln(5)}$

7. A particle executes S.H.M., the graph of velocity as a function of displacement is:

(1) a circle

(2) a parabola

(3) an ellipse

(4) a helix

Sol. **(3)**

For a body performing SHM, relation between velocity and displacement

$v = \omega\sqrt{A^2 - x^2}$

now, square both side

$v^2 = w^2 (A^2 - x^2)$

$\Rightarrow v^2 = w^2A^2 - \omega^2x^2$

$v^2 + \omega^2x^2 = \omega^2A^2$

divide whole equation by ω^2A^2

$\frac{v^2}{\omega^2A^2} + \frac{\omega^2x^2}{\omega^2A^2} = \frac{\omega^2x^2}{\omega^2A^2}$

$\frac{v^2}{(\omega A)^2} + \frac{x^2}{(A)^2} = 1$

above equation is similar as standard equation of ellipes, so graph between velocity and displacement will be ellipes.

8. A scooter accelerates from rest for time t_1 at constant rate a_1 and then retards at constant rate a_2 for time t_2 and comes to rest. The correct value of $\frac{t_1}{t_2}$ will be:

(1) $\frac{a_1 + a_2}{a_2}$

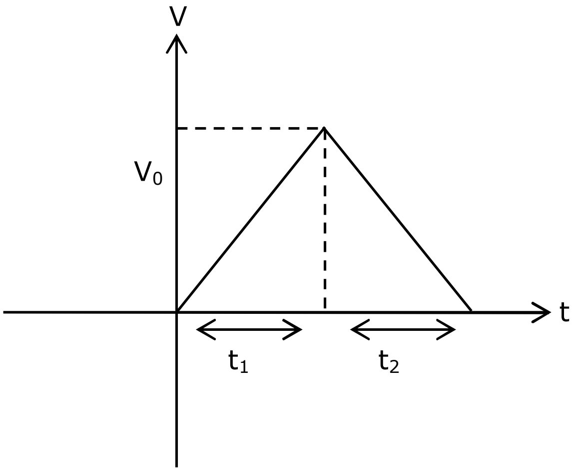
(2) $\frac{a_2}{a_1}$

(3) $\frac{a_1 + a_2}{a_1}$

(4) $\frac{a_1}{a_2}$

Sol. **(2)**

From given information:



For 1st interval

$a_1 = \frac{v_0}{t_1}$

$v_0 = a_1 t_1$ .....(1)

For 2nd interval

$a_2 = \frac{v_0}{t_2}$

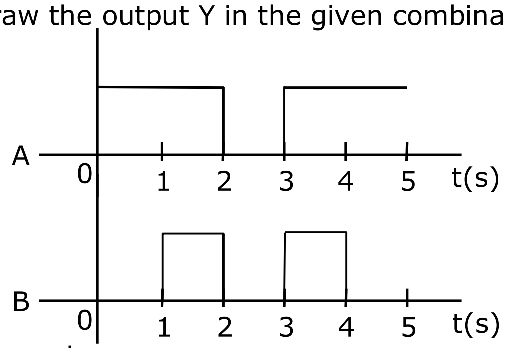
$v_0 = a_2 t_2$ .....(2)

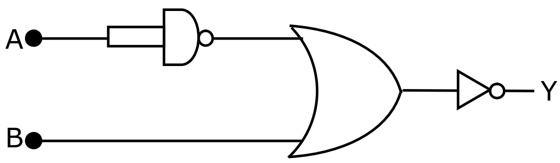
from (1) & (2)

$a_1 t_1 = a_2 t2$

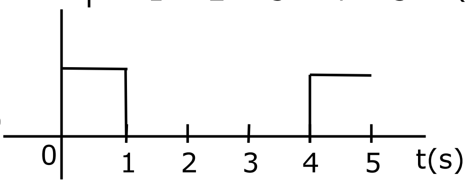
$\frac{t_1}{t_2} = \frac{a_2}{a_1}$

9. Draw the output Y in the given combination of gates.

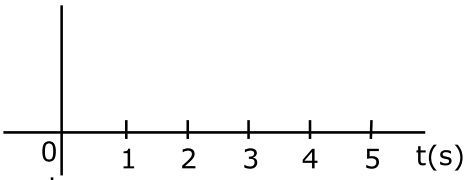




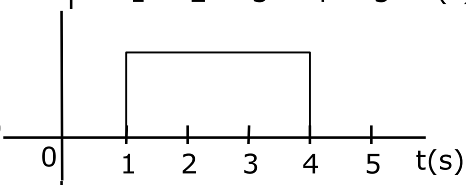
(1)



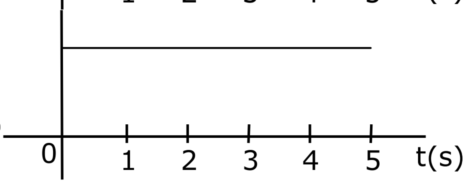
(2)



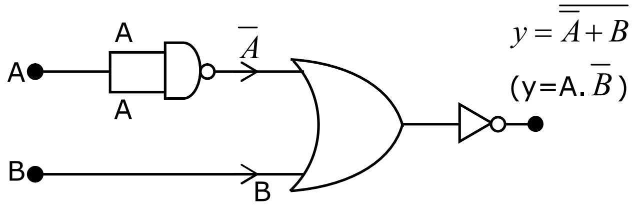
(3)



(4)



Sol. **(1)**



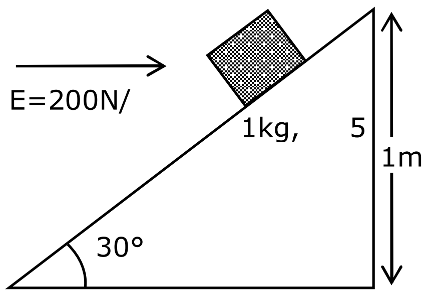
Find output expression $y = A \cdot \overline{B}$

Inputs

A	B	$y = A \cdot \overline{B}$
1	0	1
1	1	0
0	0	0
1	1	0
1	0	1

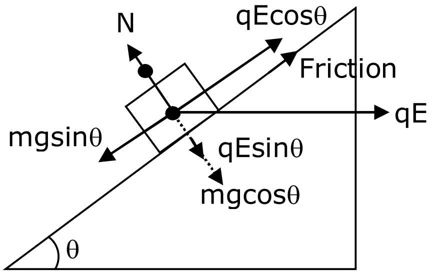
10. An inclined plane making an angle of 30º with horizontal is placed in a uniform horizontal electric field $200\frac{N}{C}$ as shown in the figure. A body of mass 1 kg and charge 5mC is allowed to slide down from rest at a height of 1m. If the coefficient of frication is 0.2, find the time taken by the body to reach the bottom.

$\left[g = 9.8m/s^2, \sin 30^\circ = \frac{1}{2}; \cos 30^\circ = \frac{\sqrt{3}}{2}\right]$



(1) 2.3 s
(2) 0.46 s
(3) 1.3 s
(4) 0.92 s

Sol. **(3)**



F= mg sinθ −(μN + q E cosθ)

F= mg sinθ – μ(mg cosθ + qE sinθ) – qE cosθ

F = 1 × 10 × sin30 – 0.2 (1 × 10 × cos30° + 200 × 5 × 10^{-3} sin30°)

- 200 × 5 × 10^{-3} cos30°

F = 2.3 N

$a = \frac{F}{m} \Rightarrow \frac{2.3}{1} \Rightarrow 2.3 m/sec^2$

$t = \sqrt{\frac{25}{9}} \Rightarrow \sqrt{\frac{2 \times 2}{2.3}} \Rightarrow 1.3\,sec$

11. If 'C' and 'V' represent capacity and voltage respectively then what are the dimensions of λ where C/V = λ?

(1) $\left[M^{-2}L^{-4}I^{3}T^{7}\right]$

(2) $\left[M^{-2}L^{-3}I^{2}T^{6}\right]$

(3) $\left[M^{-1}L^{-3}I^{-2}T^{-7}\right]$

(4) $\left[M^{-3}L^{-4}I^{3}T^{7}\right]$

Sol. **(1)**

$\therefore$ v = $\frac{w}{q}$ and c= $\frac{q}{v}$

dimension of $\frac{c}{v}$

$\Rightarrow \frac{q}{v^2}$

$\Rightarrow \frac{q}{w^2} \times q^2 \Rightarrow \frac{q^3}{w^2}$

$\Rightarrow \frac{I^3T^3}{M^2L^4T^{-4}} \Rightarrow \left[M^{-2}L^{-4}T^{7}I^{3}\right]$

12. Given below are two statements: One is labeled as Assertion A and the other is labeled as Reason R.

Assertion A : For a simple microscope, the angular size of the object equals the angular size of the image.

Reason R : Magnification is achieved as the small object can be kept much closer to the eye than 25 cm and hence it subtends a large angle.

In the light of the above statements, choose the most appropriate answer from the options given below:

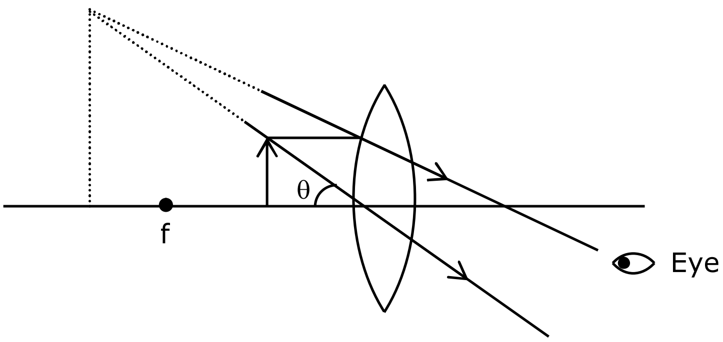
(1) Both A and R are true but R is NOT the correct explanationof A

(2) Both A and R are true and R is the correct explanation of A

(3) A is true but R is false

(4) A is false but R is true

Sol. **(2)**

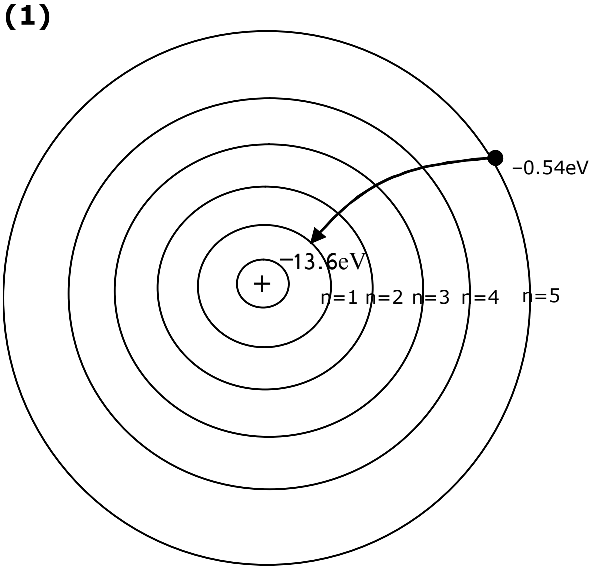


Both obtain same angle, since image can be at a distance greater than 25 cm, object can be moved closer to eye.

13. The recoil speed of a hydrogen atom after it emits a photon in going from n = 5 state to n = 1 state will be:

(1) 4.17 m/s (2) 4.34 m/s (3) 219 m/s (4) 3.25 m/s

Sol. **(1)**

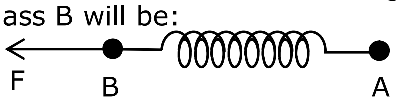


momentum (P) = $\frac{\Delta E}{C} \Rightarrow \frac{(13.6-0.54)eV}{3\times10^{8}}$

mv = $\frac{(13.06)\times1.6\times10^{-19}}{3\times10^{8}}$

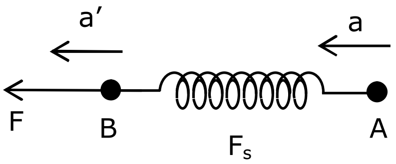
v = $\frac{(13.06)\times1.6\times10^{-19}}{3\times10^{8}\times1.67\times10^{-27}} \Rightarrow 4.17$ m/sec

14. Two masses A and B, each of mass M are fixed together by a massless springs. A force acts on the mass B as shown in figure. If the mass A starts moving away from mass B with acceleration 'a', than the acceleration of mass B will be:



(1) $\frac{F+Ma}{M}$ (2) $\frac{F-Ma}{M}$ (3) $\frac{Ma-F}{M}$ (4) $\frac{MF}{F+Ma}$

Sol. **(2)**



$F - F_s = Ma'$

$a' = \frac{F}{M}$ –9

$\frac{F-ma}{M}$

15. A wire of 1Ω has a length of 1 m. It is stretched till its length increases by 25%. The percentage change in a resistance to the nearest integer is:

(1) 25%

(2) 12.5%

(3) 76%

(4) 56%

Sol. **(4)**

For stretched or compressed wire

$R \propto l^2$

$\frac{R_1}{R_2} = \frac{l_1^2}{l_2^2}$

$\Rightarrow \frac{R}{R_2} = \frac{l^2}{(1.25l)^2}$

$\Rightarrow R_2 = 1.5625\,R$

% increase $\rightarrow$ 56.235%

16. Given below are two statements :

Statement (1) :- A second's pendulum has a time period of 1 second.

Statement (2) :- It takes precisely one second to move between the two extreme positions.

In the light of the above statements, choose the correct answer from the options give below.

(1) Both Statement I and Statement II are false

(2) Statement I is true but Statement II is false

(3) Statement I is false but Statement II is true

(4) Both Statement I and Statement II is true

Sol. **(3)**

As we know time period of second's penduklum is 2 sec, so statement (1) is incorrect.

Time taken between two extreme points in second's pendulum is 1 sec.

Above statement is correct because time taken by particle performing SHM between two extreme position is T/2.

Here, T = 2 sec.

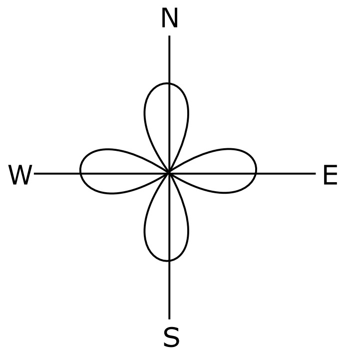
So, time = 2/2 = 1 sec

17. An aeroplane, with its wings spread 10 m, is flying at a speed of 180 km/h in a horizontal direction. The total intensity of earth's field at that part is 2.5×10^{-4} Wb/m^2 and the angle of dip is 60°. The emf induced between the tips of the plane wings will be ________.

(1) 88.37 mV (2) 62.50 mV

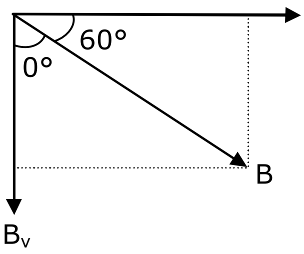
(3) 54.125 mV (4) 108.25 mV

Sol. **(4)**



$\sum = B \perp v\ell$

$\sin 60° = \frac{B_V}{B}$



$$\frac{\sqrt{3}}{2}=\frac{B_v}{B}$$

$$Bv=\frac{\sqrt{3}}{2}B$$

$$E=\frac{\sqrt{3}}{2}B\ell v$$

$$=\frac{\sqrt{3}}{2}\times 2.5\times 10^{-4}\times 10\times 180\times\frac{5}{18}$$

$$=\frac{\sqrt{3}}{2}\times 2.5\times 5\times 10^{-2}\quad =10.825\times 10^{-2}\qquad = 108.25\text{ mV}$$

18. The length of metallic wire is l_1 when tension in it is T_1. It is l_2 when the tension is T_2. The original length of the wire will be :

(1) $\frac{l_1+l_2}{2}$

(2) $\frac{T_1l_1-T_2l_2}{T_2-T_1}$

(3) $\frac{T_2l_1+T_1l_2}{T_1+T_2}$

(4) $\frac{T_2l_1-T_1l_2}{T_2-T_1}$

Sol. **(4)**

From young's modulus relation $\left(y=\frac{\frac{F}{A}}{\left(\frac{\Delta l}{l}\right)}\right)$

we can write for 1st case

$$\frac{T_1}{A}=\frac{y(\ell_1-\ell)}{\ell}$$

we can write for 2nd case

$$\frac{T_2}{A} = \frac{y(\ell_2 - \ell)}{\ell}$$

$$\frac{T_1}{T_2} = \frac{\ell_1 - \ell}{\ell_2 - \ell}$$

$$T_1\ell_2 - T_1\ell = T_2\ell_1 - T_2\ell$$

$$\frac{T_2 l_1 - T_1 l_2}{T_2 - T_1} = \ell$$

19. The internal energy (U), pressure (P) and volume (V) of an ideal gas are related as U = 3PV + 4. The gas is :

(1) polyatomic only

(2) monoatomic only

(3) either monoatomic or diatomic

(4) diatomic only.

Sol. (1)

U = 3 PV + 4

$\frac{f}{2}$ PV = 3PV + 4 $\qquad \therefore u = \frac{f}{2}nRT$

$f = 6 + \frac{8}{PV}$ $\qquad \therefore Pv = nRT$

f>6 $\therefore$ Polyatomic gas.

20. Given below are two statements :

Statement – I : An electric dipole is placed at the centre of a hollow sphere. The flux of electric field through the sphere is zero but the electric field is not zero anywhere in the sphere.

Statement – II : If R is the radius of a solid metallic sphere and Q be the total charge on it. The electric field at any point on the spherical surface of radius r (< R) is zero but theelectric flux passing through this closed spherical surface of radius r is not zero.

In the light of the above statements. Choose the correct answerfrom the option given below :

Option :

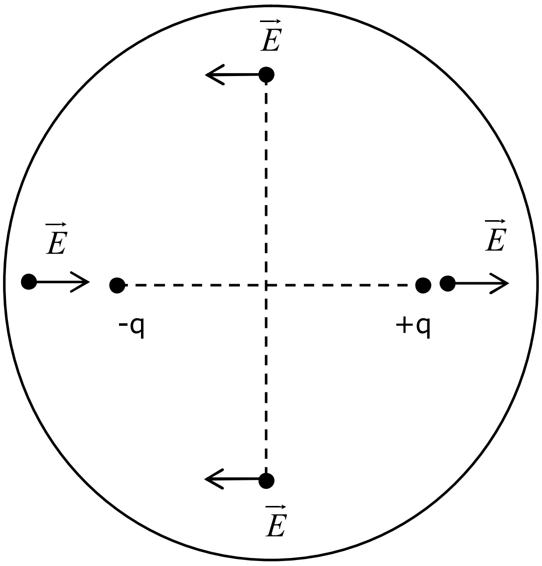
(1) Statement I is true but Statement II is false

(2) Statement I is false but Statement II is true

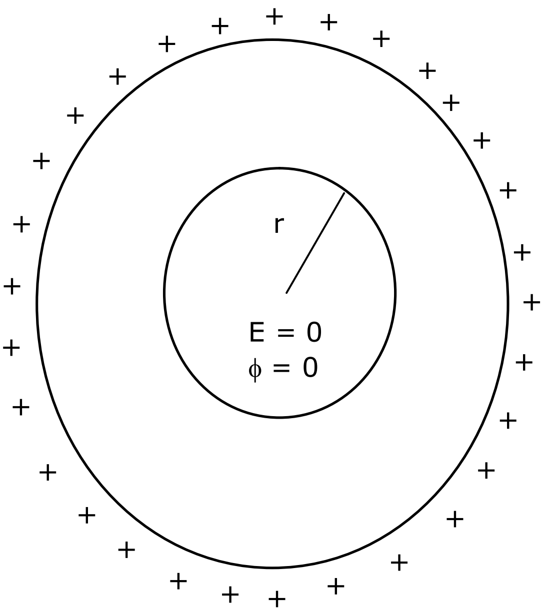
(3) Both Statement I and Statement II are true

(4) Both Statement I and Statement II are false

Sol. (1)



Statement – 1 $\rightarrow$ Correct



Statement – 2 $\rightarrow$ Incorrect

SECTION – B

1. If thehighest frequency modulating a carrier is 5 kHz, then the number of AM broadcast stations accommodated in a 90 kHz bandwidth are ________________________.

Sol. (9)

$$\text{No. of station} = \frac{\text{Band width}}{2 \times \text{Highest Band width}}$$

$$\Rightarrow \frac{90}{2 \times 5}$$

$\Rightarrow 9$

2. 1 mole of rigid diatomic gas performs a work of $\frac{Q}{5}$ when heat Q is supplied to it. The molar heat capacity of the gas during this transformation is $\frac{xR}{8}$. The value of x is __________.

Sol. (25)

From thermodynamics law:

$\Delta Q = \Delta U + \Delta W$ .....(1)

$Q = nC_v\Delta T + \frac{Q}{5}$

$Q - \frac{Q}{5} = 1 \times \frac{5}{2}R \times \Delta T$

$Q = \frac{25}{8}R\,\Delta T$ ......(2) $\therefore Q = n\,c\,\Delta T$

$C = \frac{25}{8}R$ given $C = \frac{xR}{8}$

$x = 25$

3. A particle excutes S.H.M with amplitude 'a' and time period T. The displacement of the particle when its speed is half of maximum speed is $\frac{\sqrt{x}\,a}{2}$. The value of x is _______________

Sol. (3)

Fora particle excutes S.H.M

$$V = \omega\sqrt{a^2 - x^2}$$

Given $V = \frac{V_{max}}{2} \Rightarrow \frac{A\omega}{2}$

$$\frac{A^2\omega^2}{4} = \omega^2 a^2 - \omega^2 x^2$$

$$x = \frac{\sqrt{3}}{2}a$$

4. Two stream of photons, possessing energies equal to twice and ten times the work function of metal are incident on the metal surface successively. The value of ratio of maximum velocities of the photoelectrons emitted in the two respective cases is x : y. The value of x is ________.

Sol. **(1)**

Forphotoelectric effectk.E_{max} = E – ϕ

$E_1 = 2\phi$, $k_1 = \phi$

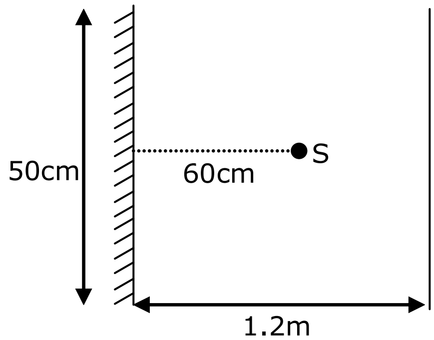
$E_2 = 10\phi$, $k_2 = 9\phi$

$\therefore V \propto \sqrt{k}$ $\left(k = \frac{1}{2}mv^2\right)$

$$\frac{v_1}{v_2} = \sqrt{\frac{1}{9}} \Rightarrow \frac{1}{3} = \frac{x}{y}$$

x = 1

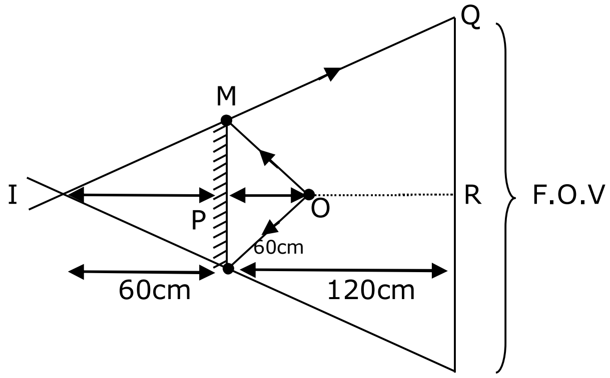
5. A point source of light S, placed at a distance 60 cm infront of the centre of plane mirror of width 50 cm, hangs vertically on a wall. A man walks infront of the mirror along a line parallel to the mirror at a distance 1.2 m from it (see in the figure). The distance between the extreme points where he can see the image of the light source in the mirror is ______________cm



Sol. **(150)**

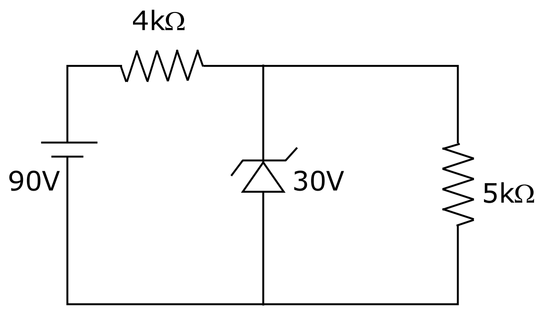
from similar triangle IMP and IQR

$$\frac{QR}{25} = \frac{180}{60} \Rightarrow QR = 7$$

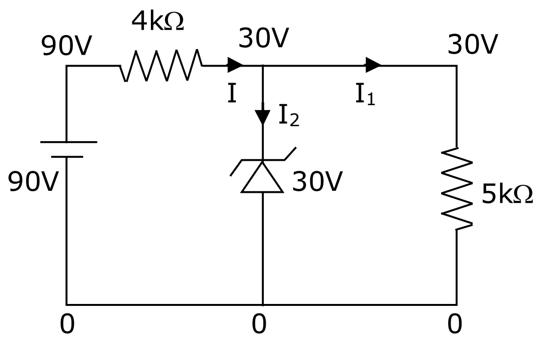


F.O.V. = 2 × 75 ⇒ 150 cm

6. The zener diode has a V_Z= 30 V. The current passing through the diode for the following ciruit is _______________mA.



Sol. (9)

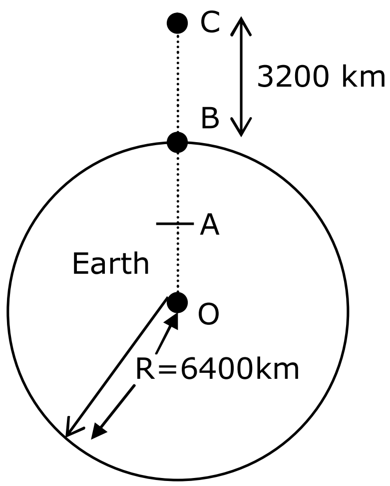


$$I = \frac{90-30}{4} = 15\text{mA}$$

$$I_I = \frac{30}{5K\Omega} = 6\text{mA}$$

$$I_2 = 15\text{mA} - 6\text{mA} = 9\text{mA}$$

7. In the reported figure of earth, the value of acceleration due to gravity is same at point A and C but it is smaller than that of its value at point B (surface of the earth). The value of OA : AB will be x : y. The value of x is _______________.



Sol. **(4)**

$$\frac{GM}{\left(\frac{3R}{2}\right)^2} = \frac{GMr}{R^3}$$

$OA = \frac{4R}{9} = r$

$AB = R - \frac{4R}{9} = \frac{5R}{9}$

OA : AB

$\frac{4R}{9} : \frac{5R}{9} \Rightarrow 4:5 = x:y$

(x=4)

8. 27 similar drops of mercury are maintained at 10 V each. All these spherical drops combine into a single big drop. The potential energy of the bigger drop is ________________ times that of a smaller drop.

Sol. **(243)**

For self energy of sphere (conducting)

$$U = \frac{kq^2}{2r}$$

For small drop $\rightarrow U_i = \frac{kq^2}{2r}$ ....(1)

After combine small drops volume remains same as bigger drop

$$\therefore \frac{4}{3}\pi r^3 \times n = \frac{4}{3}\pi R^3$$

$R = (n)^{\frac{1}{3}} r$ ....(2)

For large drop$\rightarrow U_f = \frac{k(nq)^2}{2\times 3R}$ ....(3)

From equation (1), (2), (3)

$$\frac{U_f}{U_i} = (n)^{5/3}$$

$\Rightarrow (27)^{5/3}$

$\Rightarrow 243$

9. The volume V of a given mass of monatomic gas changes with temperature T according to the relation $V = KT^{\frac{2}{3}}$. The work done when temperature changes by 90 K will be xR. The value of x is ________________.
[R =universal gas constant]

Sol. **(60)**

Given: $V = k\,T^{2/3}$

$V^{3/2} = (k)^{3/2}\,T$

$TV^{-3/2} = \text{const.}$ ......(1)

and $TV^{\gamma-1} = \text{const.}$ ......(2)

From (1) & (2)

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

$$\gamma = -\frac{1}{2}$$

Work done (w) $= \dfrac{nR\Delta T}{\gamma - 1}$

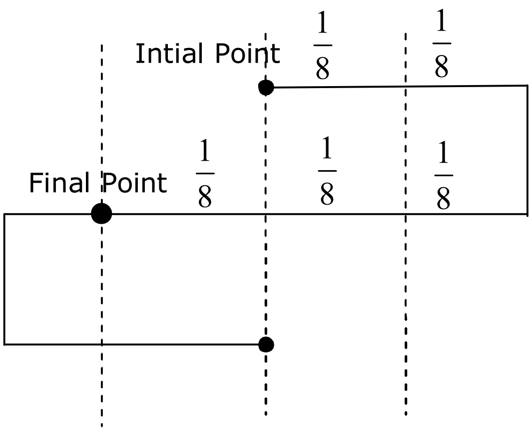
$W = \dfrac{1 \times R \times 90}{-\frac{1}{2} - 1}$ $|W| = 60R$ $x = 60$

10. Time period of a simple pendulum is T. The time taken to complete $\frac{5}{8}$ oscillations starting from mean position is $\frac{\alpha}{\beta}$T. The value of α is ___________.

Sol. **(7)**

For given $\left(\frac{5}{8}\right)$ oscillation, we can write it as $\rightarrow \left(\frac{1}{2} + \frac{1}{8}\right)$

And we know for half oscillations time $\rightarrow \frac{T}{2}$



For final point $\rightarrow \pi + \dfrac{\pi}{6}$ $\Rightarrow \dfrac{7\pi}{6}$

Time $\rightarrow \dfrac{7T}{12} \rightarrow$ given $\rightarrow \dfrac{\alpha}{\beta}T$ α = 7p

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