



PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 56

Physics

1. A circular coil of radius 4 cm having 50 turns carries a current of 2 A . It is placed in a uniform magnetic field of the intensity of 0.1

Weber m^{-2} . The work done to rotate the coil from the position by 180° from the equilibrium position

A. 0.1 J

B. 0.2 J

C. 0.4 J

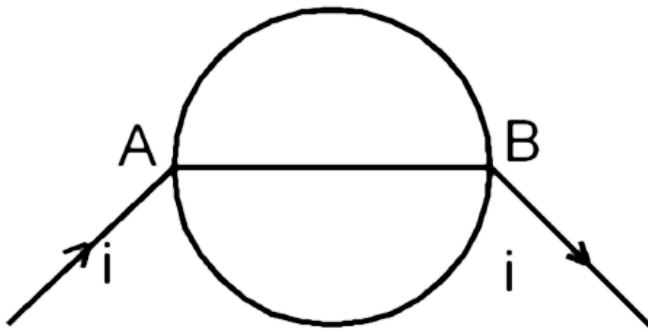
D. 0.8 J

Answer: A



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2. A wire of resistance $0.5\omega m^{-1}$ is bent into a circle of radius $1m$. The same wire is connected across a diameter AB as shown in fig. The equivalent resistance is



A. πQ

B. $\frac{\pi}{\pi + 2} \Omega$

C. $\frac{\pi}{\pi + 4} \Omega$

D. $(\pi + 1)\Omega$

Answer: C



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3. In a potentiometer experiment if the voltage across resistance R and $R + r$ are balanced at the length l_1 and l_2 respectively the value of resistance r will be

A. $\left(\frac{l_1 - l_2}{l_2}\right)R$

B. $\left(\frac{l_1 - l_2}{l_1}\right)R$

C. $\left(\frac{l_2 - l_1}{l_1}\right)R$

D. $\left(\frac{l_2 - l_1}{l_2}\right)R$

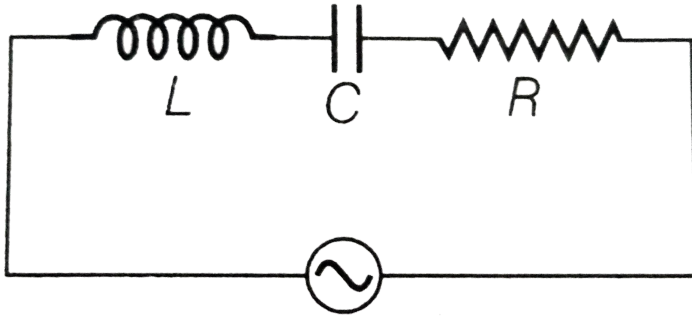
Answer: C



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4. A $100V$, AC source of frequency of $500Hz$ is connected to an L-C-R circuit with $L = 8.1mH$, $C = 12.5\mu F$, $R = 10\Omega$ all connected in series as shown in figure. What is

the quality factor of circuit?



A. 2.02

B. 2.54

C. 50.54

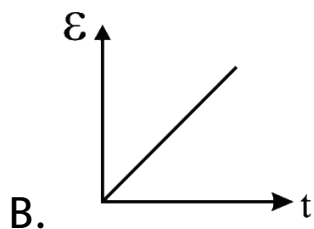
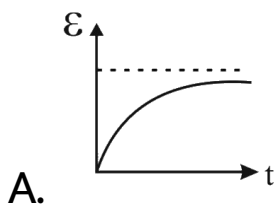
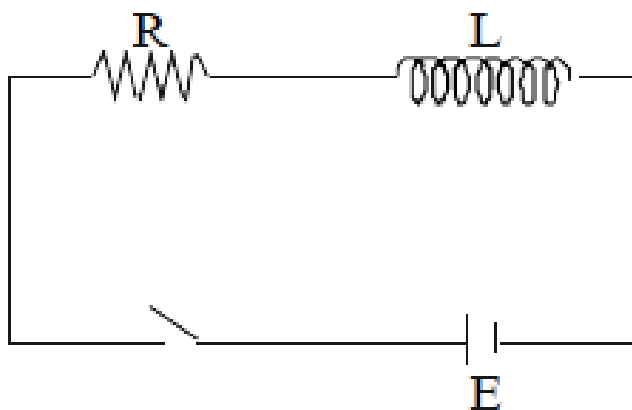
D. 200.54

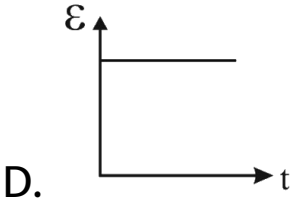
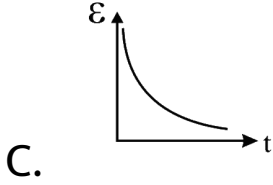
Answer: B



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5. Plot the variation of emf across the inductor with respect time __





Answer: C

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6. A charge particle q_1 , is at position $(2, -1, 3)$.
The electrostatic force on another charged particle q_2 at $(0, 0, 0)$ is :

$$\text{A. } \frac{q_1 q_2}{56\pi\epsilon_0} (2\hat{i} - \hat{j} + 3\hat{k})$$

$$\text{B. } \frac{q_1 q_2}{56\sqrt{14}\epsilon_0} (2\hat{i} - \hat{j} - 3\hat{k})$$

$$\text{C. } \frac{q_1 q_2}{56\pi\epsilon_0} (\hat{i} - \hat{j} - 3\hat{k})$$

$$\text{D. } \frac{q_1 q_2}{56\sqrt{14}\pi\epsilon_0} (-2\hat{i} + \hat{j} - 3\hat{k})$$

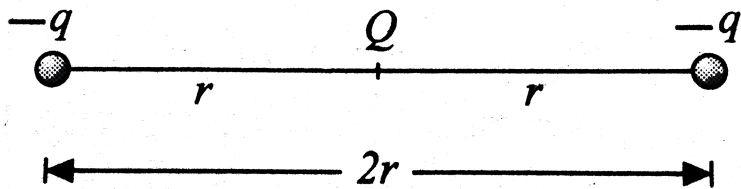
Answer: D



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7. Charges $-q$, Q , and $-q$ are placed at an equal distance on a straight line. If the total potential energy of the system of three

charges is zero, then find the ratio Q/q .



A. 1:1

B. 1:2

C. 1:3

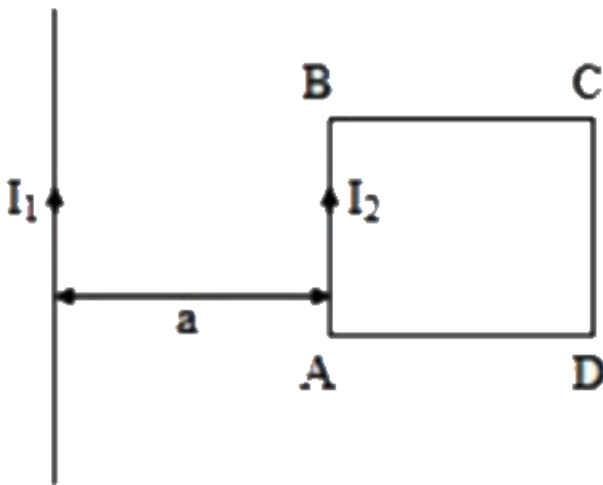
D. 1:4

Answer: D



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8. A square loop of side a is placed at a distance a length away from a long wire carrying a current I_1 . If the loop carries a current I_2 as shown in the figure. Then the nature of the force and its amount is



A. $\frac{\mu_0 I_1 I_2}{2\pi a}$, attractive

B. $\frac{\mu_0 I_1 I_2}{4\pi a}$, attractive

C. $\frac{\mu_0 I_1 I_2}{4\pi a}$, repulsive

D. $\frac{\mu_0 I_1 I_2}{4\pi a}$, repulsive

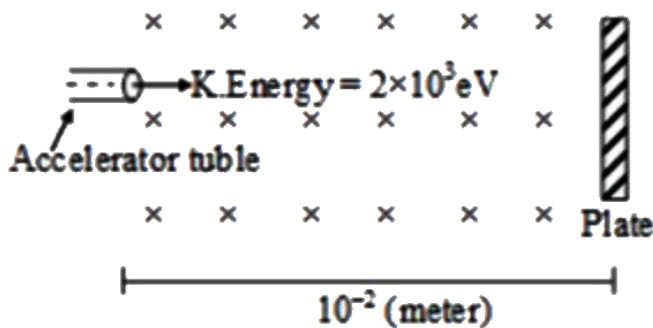
Answer: B



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9. A charged particle having a mass of $1.6 \times 10^{-26} \text{ kg}$ comes out of accelerator tube with kinetic energy $2 \times 10^3 \text{ eV}$. Calculate the

smallest magnitude of the magnetic field that should be applied in vertically downwards direction to just prevent the charged particle from colliding the plate (Assume charge on particle = charge of the proton)



A. 2 T

B. 4 T

C. 0.02 T

D. 0.04 T

Answer: A



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10. A slab consists of two parallel layers of copper and brass of the same thickness and having thermal conductivities in the ratio 1 : 4. If the free face of brass is at $100^{\circ}C$ and that of

copper at $0^{\circ}C$ the temperature of interface is

.

A. $80^{\circ}C$

B. $20^{\circ}C$

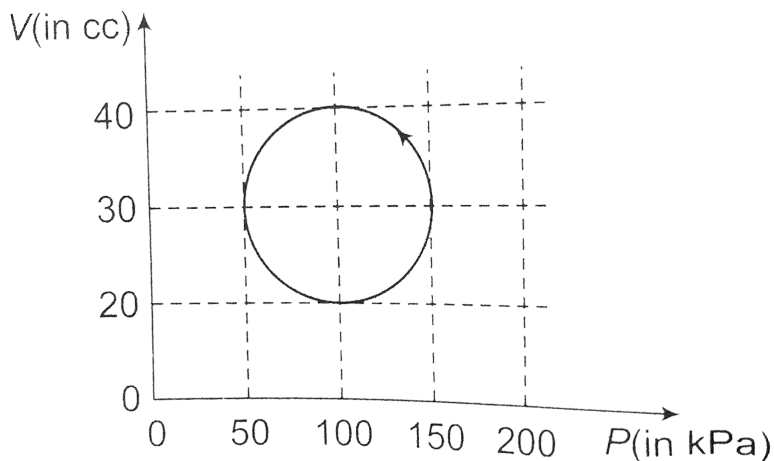
C. $60^{\circ}C$

D. $40^{\circ}C$

Answer: A



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11.

A system is taken through a cyclic process represented by a circle as shown in the figure.

The heat absorbed by the system is

A. $\pi \times 10^3 J$

B. $\frac{\pi}{2} J$

C. $4\pi \times 10^2 J$

D. πJ

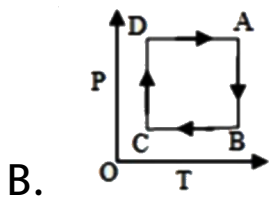
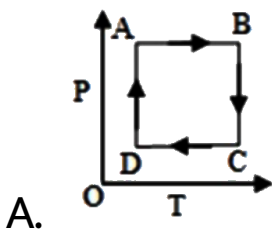
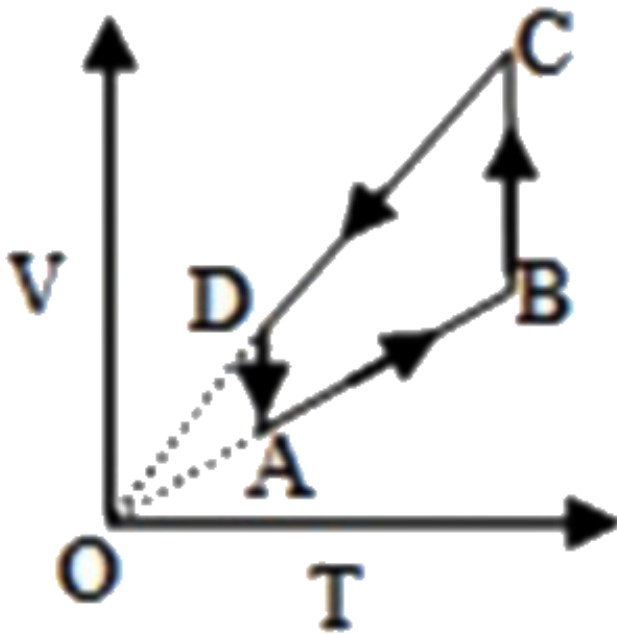
Answer: B

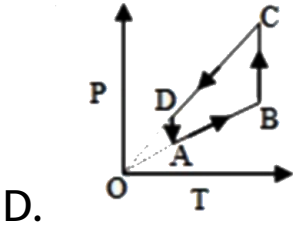
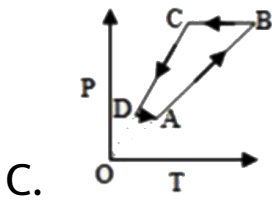


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12. A cyclic process is shown on the $V - T$ diagram . The same process on a $P - T$ diagram

is shown by





Answer: A

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13. In an adiabatic expansion of air , the volume increases by 5% What is the the

percentage change in pressure ?

$$\left[(1.05)^{\frac{7}{5}} = 1.07 \right]$$

A. 7 %

B. 5 %

C. 4 %

D. 3 %

Answer: A



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14. An iron tyre of diameter 2 m is to be fitted on to a wooden wheel of diameter 2.01 m. The temperature to which the tyre must be heated, if $\alpha = 11 \times 10^{-6} \text{ } ^\circ\text{C}^{-1}$ and room temperature is 20°C , will be

A. 474.5°C

B. 490.5°C

C. 440.5°C

D. 460.5°C

Answer: A



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15. 50 g of ice at $0^{\circ}C$ is mixed with 50 g of water at $80^{\circ}C$. The final temperature of the mixture is (latent heat of fusion of ice $= 80\text{cal/g}$, $s_w = 1\text{cal/g}^{\circ}C$)

A. $0^{\circ}C$

B. $40^{\circ}C$

C. $60^{\circ}C$

D. less than $0^{\circ}C$

Answer: A



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16. A string of mass 2.50kg is under a tension of 200N . The length of the stretched string is 20.0m . If the transverse jerk is struck at one end of the string, how long does the disturbance take to reach the other end?

A. 0.5 s

B. 1 s

C. 1.5 s

D. 2 s

Answer: A



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17. Choose the wrong statement .

A. zero - velocity of a particle at any instant
does not necessarily mean that its
acceleration is zero

- B. zero acceleration of a particle at any instant does not necessarily mean that its velocity is zero
- C. if the speed of a particle is constant, its acceleration must be zero
- D. none of the above

Answer: C



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18. When a particle moves in a circle with a uniform speed

A. its velocity and acceleration are both constants

B. its velocity is constant but the acceleration changes

C. its acceleration is constant but the velocity changes

D. its velocity and acceleration both change

Answer: D



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19. A block A kept on an inclined surface just begins to slide if the inclination is 30° . The block is replaced by another block B and it is found that it just begins to slide if the inclination is 40°

A. mass of $A >$ mass of B

B. mass of $A <$ mass of B

C. mass of = mass of B

D. all the three are possible

Answer: D



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20. An inelastic ball is dropped from a height 100 meter. If due to impact it loses 35% of its energy the ball will rise to a height of

A. 35 m

B. 65 m

C. 100 m

D. 135 m

Answer: B



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21. Two particles whose masses are 10 kg and 30 kg and their position vectors are $\hat{i} + \hat{j} + \hat{k}$ and $-\hat{i} - \hat{j} - \hat{k}$ respectively would have the centre of mass at position :-

A. $-\left(\frac{\hat{i} + \hat{j} + \hat{k}}{2}\right)$

B. $\left(\frac{\hat{i} + \hat{j} + \hat{k}}{2}\right)$

C. $-\left(\frac{\hat{i} + \hat{j} + \hat{k}}{4}\right)$

D. $\left(\frac{\hat{i} + \hat{j} + \hat{k}}{4}\right)$

Answer: A



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22. An object of mass 5 kg and speed $10ms^{-1}$ explodes into two pieces of equal mass. One

piece comes to rest. The kinetic. Energy added to the system during the explosion is :

A. zero

B. 50 J

C. 250 J

D. 500 J

Answer: C



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23. A particle strikes elastically with another particle with velocity V after collision its move with half the velocity in the same direction find the velocity of the second particle if it is initially at rest

A. $\frac{3V}{2}$

B. $\frac{V}{2}$

C. V

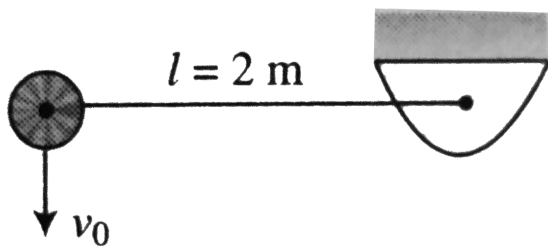
D. none of these

Answer: A



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24. A small sphere is given vertical velocity of magnitude $v_0 = 5\text{ms}^{-1}$ and it swings in a vertical plane about the end of a massless string. The angle θ with the vertical at which string will break, knowing that it can withstand a maximum tension equal to twice the weight of the sphere, is



A. $\cos^{-1}\left(\frac{2}{3}\right)$

B. $\cos^{-1}\left(\frac{1}{4}\right)$

C. 60°

D. 30°

Answer: B



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25. The height above surface of earth where the value of gravitational acceleration is one fourth of that at surface, will be

A. $\frac{R_e}{4}$

B. $\frac{R_e}{2}$

C. $\frac{3R_e}{4}$

D. R_e

Answer: D



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26. The orbital velocity of an artificial satellite in a circular orbit just above the earth's surface is V_0 . For a satellite orbiting at an

altitude of half of earth's radius, the orbital velocity is

A. $\frac{3}{2}v$

B. $\sqrt{\frac{3}{2}}$

C. $\sqrt{\frac{2}{3}}$

D. $\frac{2}{3}v$

Answer: C



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27. For definite length of wire, if the weight used for applying tension is immersed in water , then frequency will

- A. become less
- B. become more
- C. remain equal
- D. become zero

Answer: A



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28. A simple pendulum 4 m long swings with an amplitude of 0.2 m. What is its acceleration at the ends of its path? ($g = 10\text{ m/s}^2$)

A. zero

B. 10 m/s^{-2}

C. 0.5 m/s^{-2}

D. 2.5 m/s^{-2}

Answer: C



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29. The bulk modulus of water is $2.0 \times 10^9 \text{ N/m}^2$. The pressure required to increase the density of water by 0.1 % is

A. $2 \times 10^9 \text{ Nm}^{-2}$

B. $2 \times 10^8 \text{ Nm}^{-2}$

C. $2 \times 10^6 \text{ Nm}^{-2}$

D. $2 \times 10^4 \text{ Nm}^{-2}$

Answer: C



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30. A mosquito with 8 legs stands on water surface and each leg makes depression of radius 'a'. If the surface tension and angle of contact are 'T' and zero respectively, then the weight of mosquito is:

A. $8 Ta$

B. $16\pi Ta$

C. $\frac{Ta}{8}$

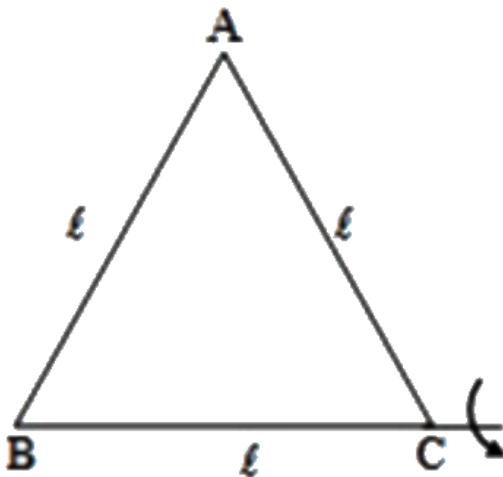
D. $\frac{Ta}{16\pi}$

Answer: B



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31. Three identical rods each of mass M , length l are joined to form an equilateral $\triangle ABC$. Find the Moment of Inertia about BC as shown.



A. $\frac{2}{3}Ml^2$

B. $\frac{Ml^2}{4}$

C. $\frac{Ml^2}{2}$

D. none

Answer: C



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32. A big particle of mass $(3+m)$ kg blasts into 3 pieces , such that a particle of mass 1 kg moves along x - axis , with velocity $2ms^{-1}$ and

a particle of mass 2 kg moves with velocity 1ms^{-1} perpendicular to direction of 1 kg particle . If the third particle moves with velocity $\sqrt{2}\text{ms}^{-1}$, then m is

A. 2 kg

B. 1 kg

C. $2\sqrt{2}$ kg

D. none of these

Answer: A



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33. An alpha particle of energy $5MeV$ is scattered through 180° by a found uramiam nucleus . The distance of closest approach is of the order of

A. 1\AA

B. $10^{-10}cm$

C. $10^{-12}cm$

D. $10^{-15}cm$

Answer: C



34. A hydrogen atom in ground state absorbs $10.2eV$ of energy .The orbital angular momentum of the electron is increases by

A. $1.05 \times 10^{-34} Js$

B. $2.11 \times 10^{-34} Js$

C. $3.16 \times 10^{-34} Js$

D. $4.22 \times 10^{-34} Js$

Answer: A



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35. The activity of a radioactive element decreases to one third of the original activity I_0 in a period of nine years. After a further lapse of nine years, its activity will be

A. I_0

B. $\left(\frac{2}{3}\right)I_0$

C. $\left(\frac{I_0}{9}\right)$

D. $\left(\frac{I_0}{6}\right)$

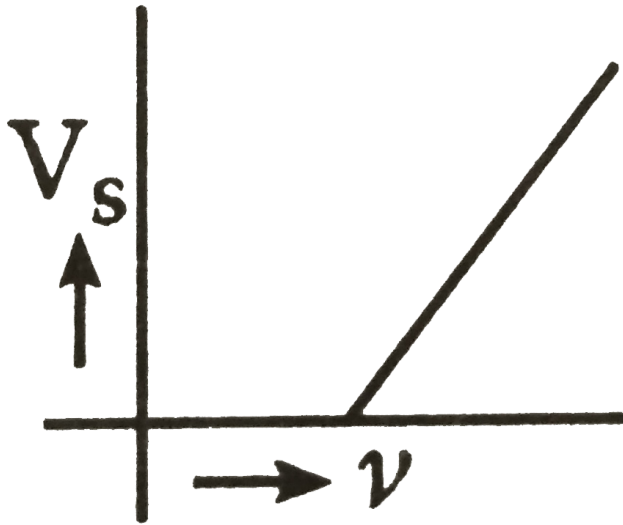
Answer: C



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36. In photoelectric effect the slope of straight line graph between stopping potential (V_s)

and frequency of incident light (ν) gives



- A. charge on electrons
- B. work function of emitter
- C. Planck's constant
- D. ratio of Planck 's constant to charge on electron

Answer: D



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37. A photocell is illuminated by a small bright source placed 1m away. When the same source of light is placed $(1/2)$ m away, the number of electrons emitted by photocathode would

- A. increase by a factor 2
- B. decrease by a factor 2
- C. increase by a factor 4

D. decrease by a factor 4

Answer:



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38. $\overline{A \cdot \overline{B} + \overline{A} \cdot B}$ is equivalent to

A. $A \cdot \overline{B} + \overline{A} \cdot B$

B. $(A + \overline{B})(\overline{A} + B)$

C. $\overline{A \cdot \overline{B} + \overline{A} \cdot B}$

D. $(A + B) \cdot (\overline{A} + B)$

Answer: B



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39. In a transistor the base is made very thin and is lightly doped with an impurity, because.

A. to save the transistor from heating effect

B. to enable the emitter to emit small number of electrons and holes

C. to enable the collector to collect 95% of the holes or electron coming from the emitter side

D. none of the above

Answer: C



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40. The current gain for a transistor used in common - emitter configuration is 98. If the

load resistance be $1M\Omega$ and the internal resistance be 600Ω , what is the voltage gain ?

A. 90

B. 95

C. 100

D. none

Answer: D



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41. The dispersive powers of flint glass and crown glass are 0.053 and 0.034 respectively and their mean refractive indices are 1.68 and 1.53 for white light .Calculate the angle of the flint glass prism required to form an achromatic combination with a crown glass prism of refracting angle 4° .

A. 2°

B. 4°

C. 5°

D. 6°

Answer: C



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42. An equilateral prism deviates a ray through 45° for the two angles of incidence differing by 20° . The angle of incidence is

A. 60° and 40°

B. 50° and 70°

C. $62^{\circ} 30'$ and $42^{\circ} 30'$

D. $60^{\circ} 30'$ and $40^{\circ} 30'$

Answer: C



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43. A narrow slit of width 2 mm is illuminated by monochromatic light of wavelength 500nm. The distance between the first minima on either side on a screen at a distance of 1 m is

A. 1.2 cm

B. 1.2 mm

C. 2.4 cm

D. 2.4 mm

Answer: D



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44. Unpolarized light of intensity $32Wm^{-2}$ passes through three polarizers such that transmission axes of the first and second

polarizer make an angle 30° with each other and the transmission axis of the last polarizer is crossed with that of the first . The intensity of the final emerging light will be

A. $32Wm^{-2}$

B. $3Wm^{-2}$

C. $8Wm^{-2}$

D. $4Wm^{-2}$

Answer: B



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45. Two thin uniform rings made of same material and of radii R and $4R$ are joined as shown. The mass of smaller ring is m . Find the $M. I.$ about an axis passing through the center of mass of system of rings and perpendicular to the plane.

A. $85mR^2$

B. $90mR^2$

C. $70mR^2$

D. $35mR^2$

Answer: B



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