PHYSICS

BOOKS - NTA MOCK TESTS

NEET MOCK TEST 10

Physics

1. The rate of change of torque $'\tau'$ with deflection θ is maximum for a magnet suspended freely in a uniform magnetic field of induction B when θ is equal to

A. $\theta = 0^\circ$

B. $\theta = 45^\circ$

C. $\theta = 60^\circ$

D. $\theta = 90^\circ$

Answer: A

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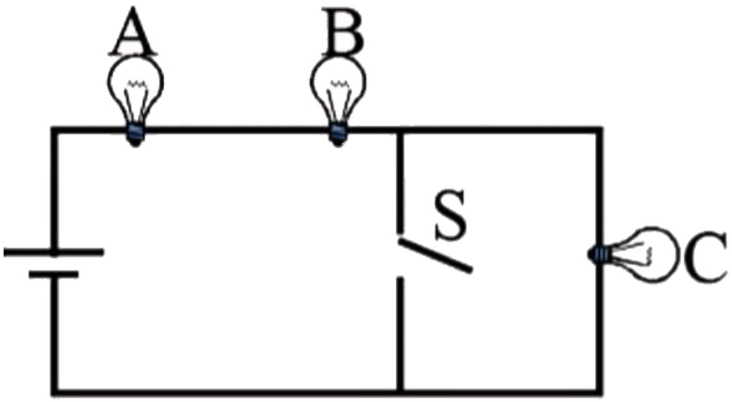
2. A circuit consists of three identical lamps connected to a battery as shown in figure. When the switch S is closed then the intensities of lamps A and B



A. will increase by eight times

B. will decrease by two times

C. will increase by more than two times

D. will remain the same

Answer:

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3. When a shunt of 4Ω is attahced to a galvanometer, the deflection reduces to $\frac{1}{5}$th. If an additional shunt of 2Ω is attached. What will be the deflection?

A. $\frac{1}{10}$ th of initial

B. $\frac{1}{13}$ th of initial

C. remains the same

D. none of these

Answer:

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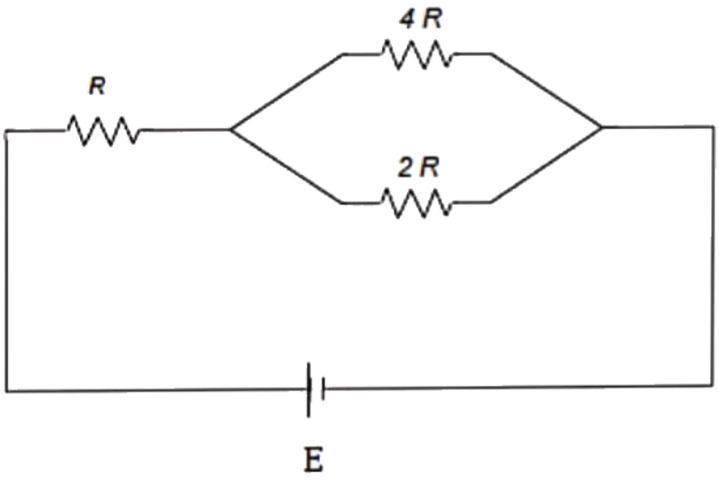
4. The figure shows a network in which the cell is deal and it has an emf E. The potential difference across the resistance 2R is



A. 2E

B. $\frac{4E}{7}$

C. $\frac{E}{7}$

D. $\frac{3E}{7}$

Answer:

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5. A step-up transformer has transformation ratio of $3:2$ what is the voltage in secondary if voltage in primary is $30V$?

A. 45V

B. 15V

C. 90V

D. 300V

Answer:

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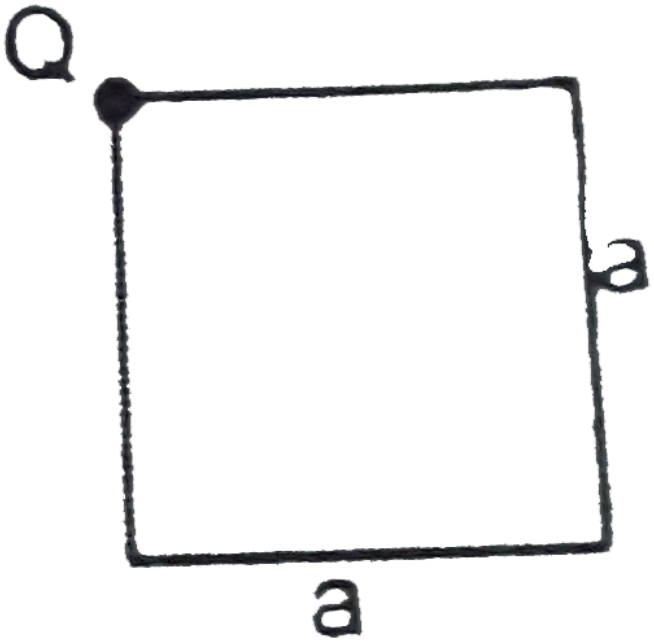
6. A point charge Q is placed at the corner of a square of side a, then find the flux through the square.



A. $\frac{Q}{8 \in_0}$

B. $\frac{Q}{4 \in_0}$

C. $\frac{Q}{\in_0}$

D. Zero

Answer:

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7. In Young's double-slit experiment, the separation between the slits is halved and the distance between the slits and the screen in doubled. The fringe width is

A. remain the same

B. be halved

C. be doubled

D. be quadrupled

Answer:

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8. Three long straight conductors are arranged parallel to each other in the same plane and carrying currents of $1A$, $2A$ and$3A$ all in the same direction. The distance between the first two conductors is x

and the distance between the second and third conductorsy. If the middle conductor is in equilibrium, the ratio $x : y$ is

A. $1 : 3$

B. $3 : 1$

C. $1 : \sqrt{3}$

D. $\sqrt{3} : 1$

Answer:

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9. A particle of mass m and charge q moves with a constant velocity v along the positive x direction. It enters a region containing a uniform magnetic field B directed along the negative z direction, extending from $x = a$ to $x = b$. The minimum value of v required so that the particle can just enter the region $x > b$ is

A. $\frac{qbB}{m}$

B. $\frac{q(b-a)B}{m}$

C. $\frac{qaB}{m}$

D. $\frac{q(b+a)B}{2m}$

Answer:

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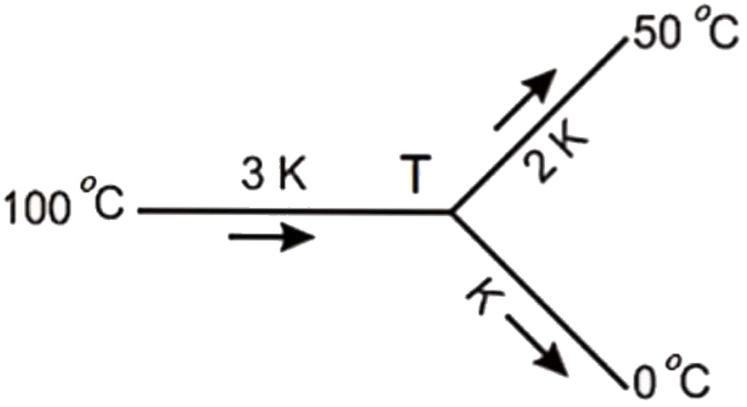
10. Three rods of the same dimension have thermal conductivity 3K, 2K and K as shown in the figure. The temperature of the junction in

steady-state is



A. $\frac{200}{3}^{\circ}C$

B. $\frac{100}{3}^{\circ}C$

C. $75^{\circ}C$

D. $\frac{50}{3}^{\circ}C$

Answer:

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11. If 21 J of heat energy is supplied to an ideal diatomic gas at constant pressure, then the change in its energy is

A. 10J

B. 12J

C. 15J

D. 18J

Answer:

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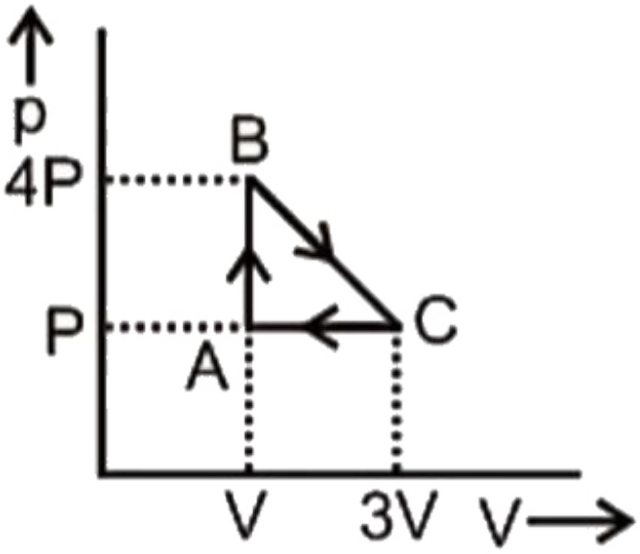
12. An ideal gas is taken around the cycle ABCA as shown in the P-V diagram. The total work done by the gas during the cycle is



A. PV

B. 2PV

C. 4PV

D. 3PV

Answer:

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13. In a process, temperature and volume of one mole of an ideal monoatomic gas are varied according to the relation VT= K, where K is a constant. In this process the temperataure of the gas is increased by ΔT. The amount of heat absorbed by gas is (R is gas constant).

A. $\frac{1}{2}R\Delta T$

B. $\frac{3}{2}R\Delta T$

C. $\frac{2}{3}R\Delta T$

D. $\frac{1}{3}R\Delta T$

Answer:

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14. Consider a mixture of n moles of helium gas and 2n moles of oxygen gas (molecules taken to be rigid) as an ideal gas. Its C_p/C_v value will be:

A. $\frac{23}{15}$

B. $\frac{40}{27}$

C. $\frac{67}{45}$

D. $\frac{19}{13}$

Answer:

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15. The percentage change in internal energy, when a gas is cooled from $927^\circ C$ to $27^\circ C$, is

A. 0.75

B. 3

C. 0.5

D. 1

Answer:

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16. A string is hanging from a rigid support. A transverse pulse is excited at its free end. The speed at which the pulse travels a distance x is proportional to

A. x^2

B. x

C. $\sqrt{x}$

D. $\frac{1}{x}$

Answer:

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17. While measuring the speed of sound by performing a resonance column experiment, a student gets the first resonance condition at a column length of $18cm$ during winter. Repeating the same experiment during summer, she measures the column length to be xcm for the second resonance. Then

A. $x < 18$

B. $x > 54$

C. $18 < x < 36$

D. $18 < x < 54$

Answer:

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18. a projectile is fired from the surface of the earth with a velocity of $5ms^{-1}$ and angle θ with the horizontal. Another projectile fired from

another planet with a velocity of $3ms^{-1}$ at the same angle follows a trajectory which is identical with the trajectory of the projectile fired from the earth.The value of the acceleration due to gravity on the planet is in ms^{-2} is given $\left(g = 9.8ms^{-2}\right)$

A. $16.3ms^{-2}$

B. $1.8ms^{-2}$

C. $3.5ms^{-2}$

D. $5.9ms^{-2}$

Answer:

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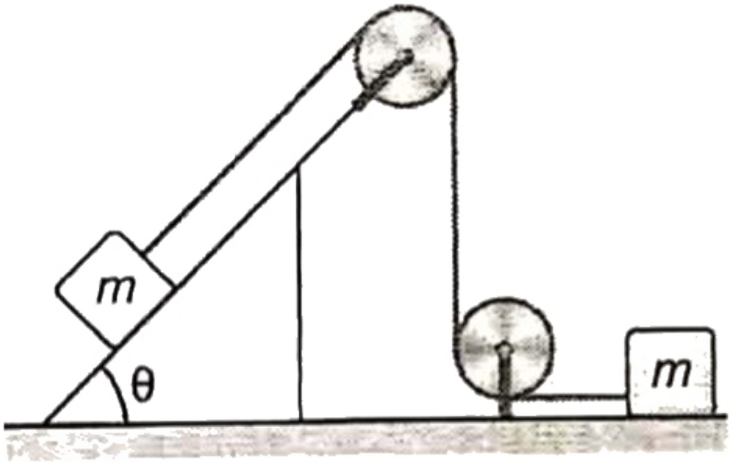
19. For the system shown in the figure, the inclined plane is fixed, all the pulleys are light and friction is absent every where.The tension in

the string will be



A. $\frac{2}{3}mg\sin\theta$

B. $\frac{3}{2}mg\sin\theta$

C. $\frac{1}{2}mg\sin\theta$

D. $2mg\sin\theta$

Answer:

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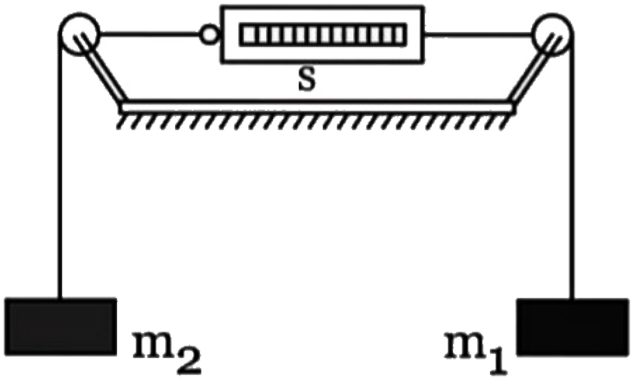
20. In the arrangement shown, the pulleys, string and the spring balance, all the ideal. If $m_1 > m_2$, then the reading of the spring balance is



A. $m_1 - m_2$

B. $\frac{1}{2}(m_1 + m_2)$

C. $\frac{4m_1m_2}{m_1 + m_2}$

D. $\frac{2m_1m_2}{m_1 + m_2}$

Answer:

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21. it is estimated that per minute, each cm^2 of earth recives about 2 calories of heat energy from the sun. This constant is called solar constant S. Express solar constant in SI units.

A. $8kWm^{-2}$

B. $1.4kWm^{-2}$

C. $1.8kWm^{-2}$

D. $2.5kWm^{-2}$

Answer:

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22. The potential energy of a particle under a conservative force is given by $U(x) = \left(x^2 - 3x\right)$ J. The equilibrium position of the particle

is at

A. $x = 1.5m$

B. x = 2m

C. x = 2.5m

D. x= 3m

Answer:

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23. A bullet of mass 0.02 kg travelling horizontally with velocity 250 ms^{-1} strikes a block of wood of mass 0.23 kg which rests on a rough horizontal surface. After the impact, the block and bullet move together and come to rest after travelling a distance of 40m. The coefficient of sliding friction of the rough surface is $\left(g = 9.8ms^{-2}\right)$

A. 0.75

B. 0.61

C. 0.51

D. 0.30

Answer:

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24. A skater of mass m standing on ice throws a stone of mass M =2m with a velocity of $v = 5m/s$ in horizontal direction. If the coefficient of friction between the skater and the ice is 0.5 , find the distance over which the skater will move (take $g = 10ms^{-2}$)

A. 20m

B. 15m

C. 10m

D. 5m

Answer:

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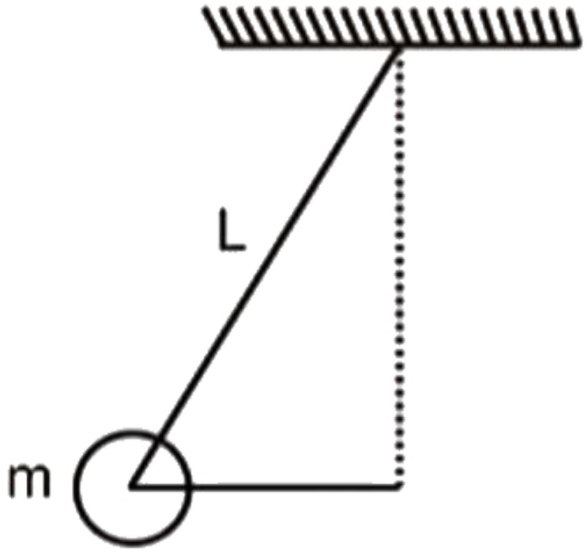
25. A ball of mass m = 0.5 kg is attached to the end of a string having length L = 0.5 is rotated on a horizontal circular path about the vertical axis. The maximum tension that the string can bear is 324N.What is the maximum possible value of angular velocity of ball (in radian / s) ?



A. 9

B. 18

C. 27

D. 36

Answer:

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26. The distance of Neptune and Saturn from the Sun are respectively 10^{13} and 10^{12} meters and their periodic times are respectively T_n and T_s. If their orbits are circular, then the value of T_n / T_s is

A. 10

B. 100

C. $10\sqrt{10}$

D. 1000

Answer:

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27. If a man goes from the surface of Earth to a height equal to the radius of the Earth, then what will be his weight relative to that on the Earth? What if he goes equally below the surface of Earth?

A. $\frac{1}{2}$

B. $\frac{1}{3}$

C. $\frac{1}{4}$

D. 1

Answer:

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28. A particle starts oscillating simple harmonically from its equilibrium position then, the ratio of kinetic energy and potential energy of the particle at the time $T/12$ is: $(T = \text{time period})$

A. $1:4$

B. $2:1$

C. $3:1$

D. $4:1$

Answer:

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29. The phase difference between two waves represented by $y_1 = 10^{-6}\sin[100t + (x/50) + 0.5]m, y_2 = 10^{-6}\cos[100t + (x/50)]m$ where x is expressed in metres and t is expressed in seconds, is approximately

A. 1.07 radians

B. 2.07 radians

C. 0.5 radian

D. 1.5 radians

Answer:

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30. What will be the change in interatomic distance (in $\mathring{A}$) of steel on applying a stress of $10^9 N/m^2$. The Young's modulus of steel is $2 \times 10^{11} N/m^2$ and the interatomic distance in steel is $2.8\mathring{A}$.

A. 7×10^{-3}

B. 14×10^{-3}

C. 21×10^{-3}

D. 28×10^{-3}

Answer:

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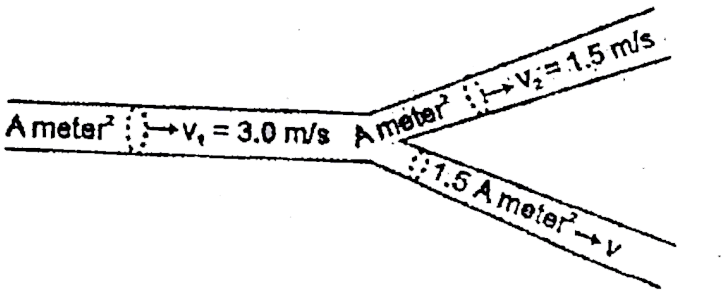
31. An incompressible liquid flows through a horizontal tube as shown in the figure. Then the velocity 'v' of the fluid is:



A. $3.0m/s$

B. $1.5m/s$

C. $1.0m/s$

D. $2.25m/s$

Answer:

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32. Two blocks of masses 10 kg and 30 kg are placed along a vertical line. The first block is raised through a height of 7 cm. By what distance should the second mass be moved to raise the centre of mass by 1 cm?

A. 1 cm up

B. 1 cm down

C. 2 cm down

D. 2 cm up

Answer:

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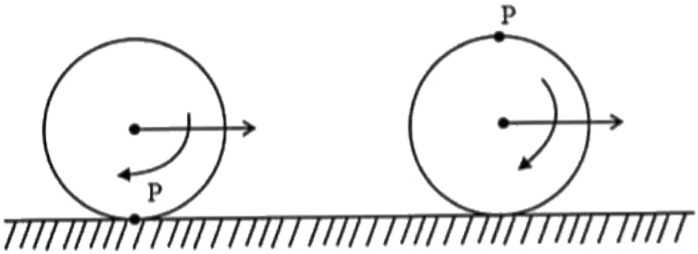
33. If a given point P is in contact with ground initially and wheel of radius R is in pure rolling, then the displacement of point P when point P reaches topmost of the sphere for the first time will be



A. πR

B. $2\pi R$

C. $\left(\sqrt{\pi^2+1}\right)R$

D. $\left(\sqrt{\pi^2+4}\right)R$

Answer:

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34. How many different wavelength may be observed in the spectrum from a hydrogen sample if the atoms excited to states with principal quantum number n?

A. $\frac{n(n-1)}{2}$

B. $\frac{n(n+1)}{2}$

C. $\frac{n(n+2)}{2}$

D. $\frac{n(n-2)}{2}$

Answer:

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35. 1 amu (atomic mass unit) mass is equal to energy of

A. 931 keV

B. 93.1 eV

C. 931 MeV

D. 9.31 MeV

Answer:

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36. To measure the resistance of a galvanometer by half deflection method, a shunt is connected to the galvanometer . The shunt is

A. low resistance connected in parallel

B. low resistance connected in series

C. high resistance connected in parallel

D. high resistance connected in series

Answer:

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37. Cadmium and Broron rods are used in a nuclear reactor to

A. slowing down fast neutrons

B. speeding up slow neutrons

C. absorbing neutrons

D. provides more fuel to nuclear reactor

Answer:

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38. Calculate the number of photons emitted per second by a 10 watt sodium vapor lamp. Assume that 90% of the consumed energy is converted into light. Wavelength of sodium light is 590nm. $h = 6.62 \times 10^{-34} Js$

A. 1.67×10^{18}

B. 1.67×10^{20}

C. 2.67×10^{19}

D. 3.67×10^{23}

Answer:

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39. A proton when accelerated through a potential difference of V volt has a wavelength λ associated with it. An alpha-particle in order to have the same λ must be accelerated through a potential difference of

A. V volt

B. 4V volt

C. 2V volt

D. $(V/8)$ volt

Answer:

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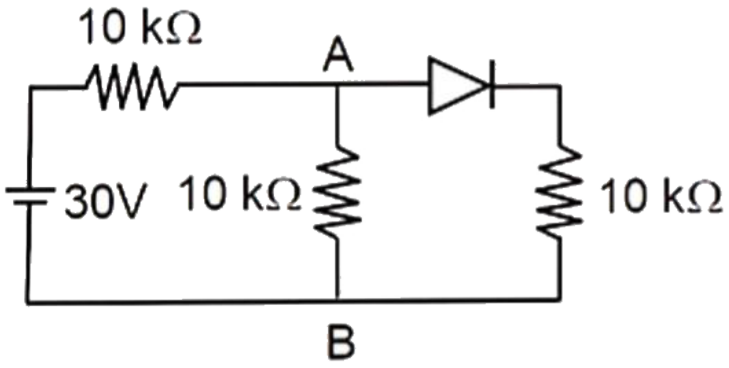
40. Find the potential difference between A and B as shown in the figure



A. 15V

B. Zero

C. 10V

D. 5V

Answer:

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41. when the electrical conductivity of a semiconductor is due to the breaking of its covalent bonds, then the semiconductor is said to be

A. donor

B. acceptor

C. intrinsic

D. extrinsic

Answer:

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42. Two plano-convex lenses of focal lengths 20cm and 30cm are placed together to form a double convex lens. The final focal length will be

A. 12 cm

B. 60 cm

C. 20 cm

D. 30 cm

Answer:

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43. A ray of light is incident normally on one of the faces of a prism of apex angle 30 degree and refractive index sqrt2. The angle of deviation of the ray is...degrees.

A. 30°

B. 45°

C. 15°

D. none of these

Answer:

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44. In Young's experiment, the third bright band for the wavelength of light source A having wavelength 6000Å coincides with the fourth bright band for source B in the same arrangement .Wavelength of light emitted by source B is

A. 6289Å

B. 4500Å

C. 2250Å

D. 6000Å

Answer:

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45. In Young's double slit experiment how many maximas can be obtained on a screen (including the central maximum) on both sides of the central fringe if $\lambda = 2000\text{Å}$ and $d = 7000\text{Å}$

A. 12

B. 7

C. 18

D. 6

Answer:

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