# PHYSICS

# BOOKS - NTA MOCK TESTS

# NEET MOCK TEST 5

## Physics Single Choice

**1.** Two bodies of masses 10 kg and 100 kg are seperated by a distance of 2 m. The

gravitational potential at the mid-point of the line joining the two bodies is:

A. $-7.3 \times 10^{-7} J/kg$

B. $-7.3 \times 10^{-8} J/kg$

C. $-7.3 \times 10^{-9} J/kg$

D. $-7.3 \times 10^{-6} J/kg$

**Answer: C**

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**2.** A convex lens is dipped in a liquid whose refractive index is equal to the refractive of the lens. Then its focal length will

A. decrease

B. become zero

C. become infinite

D. remain the same

**Answer: C**

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**3.** After perfectly inelastic collision between two identical balls moving with same speed in different directions, the speed of the combined mass becomes half the initial speed. Find the angle between the two before collision.

A. $60^\circ$

B. $45^\circ$

C. $120^\circ$

D. $30^\circ$

**Answer: C**

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**4.** The wavelength of maximum energy released during an atomic axplosion was $2.93 \times 10^{-10} m$. Given that Wien's constant is $2.93 \times 10^{-3} m - K$, the maximum temperature attained must be of the order of

A. $10^{-7} K$

B. $10^{7} K$

C. $10^{-3}K$

D. $5.86 \times 10^{7}K$

**Answer: B**

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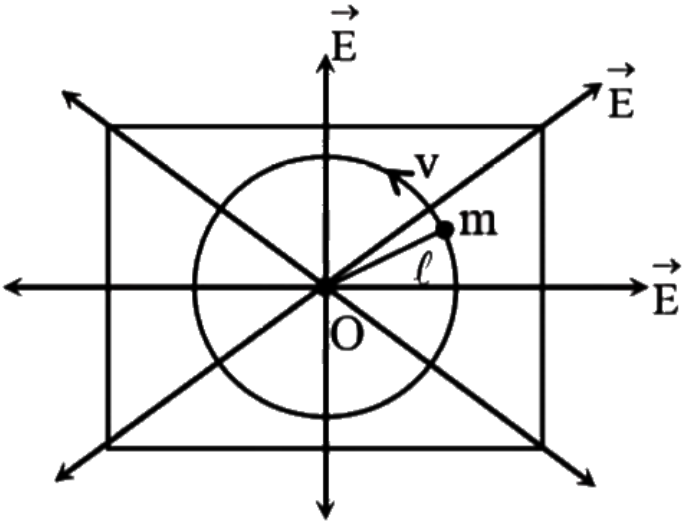
**5.** A bob of mass m is tied with a thread and is made to move in a circular path on a frictionless table surface about point 'O' as shown in diagram. A hypothetical electric field in radial direction exists along the table

surface. In this condtion the bob is uncharged and tension is thread is T. If bob is given some charge-




A. Tension in thread must increase

B. Tension in thread may increase or decrease

C. Tension in thread will remain unchanged

D. Tension in thread must decrease

**Answer: B**

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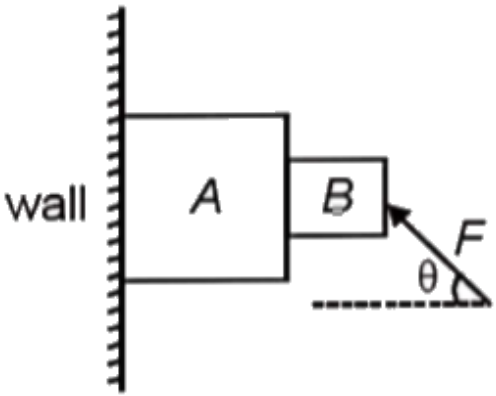
**6.** Consider the situation shown in the figure. The wall is smooth but the surface of blocks A and B in contact are rough. The friction of B

due to A in equilibrium




A. Is upward

B. Is downward

C. Is zero

D. The system cannot remain in equilibrium for any value of F

**Answer: A**

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**7.** An engine is attahed to a wagon through a shock absorber of length 1.5m. The system with a total mass of 50,000kg is moving with a speed of $36kmh^{-1}$ when the brakes are applied to bring it to rest. In the process of the system being brought to rest, the spring of the shock absorber gets compressed by

$1.0m$. If $90\,\%$ of energy of the wagon is lost due to friction, calculate the spring constant.

A. $5.0 \times 10^5 N/m$

B. $4.0 \times 10^5 N/m$

C. $1.0 \times 10^5 N/m$

D. $2.0 \times 10^5 N/m$

**Answer: A**

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**8.** If $R_1$ and $R_2$ are the resistances of the filaments of 200 W and 100 W electric bulbs operated at 220 V, then $\left(\frac{R_1}{R_2}\right)$ is

A. 2

B. 0.5

C. 4

D. 0.25

**Answer: B**

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**9.** If $N_0$ is the original mass of the substance of half - life period $t_{1/2} = 5year$ then the amount of substance left after $15$ year is

A. $\frac{N_0}{8}$

B. $\frac{N_0}{16}$

C. $\frac{N_0}{2}$

D. $\frac{N_0}{4}$

**Answer: A**

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**10.** A mass of 2kg is attached to the spring of spring constant $50Nm^{-1}$. The block is pulled to a distance of 5 cm from its equilibrium position at $x = 0$ on a horizontal frictionless surface from rest at t=0. Write the expression for its displacement at anytime t.

A. $5\sin(5t + \pi/2)$

B. $\sin(5t + \pi/2)$

C. $5\sin(5t + 3\pi/2)$

D. $5\sin(t + \pi/2)$

**Answer: A**

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**11.** A vehicle of mass $m$ is moving on a rough horizontal road with momentum $p$ . If the coefficient of friction between the tyres and the road be $\mu$, then the stopping distance is:

A. $\frac{p}{2\mu mg}$

B. $\frac{p^2}{2\mu mg}$

C. $\frac{p}{2\mu m^2 g}$

D. $\frac{p^2}{2\mu m^2 g}$

**Answer: D**

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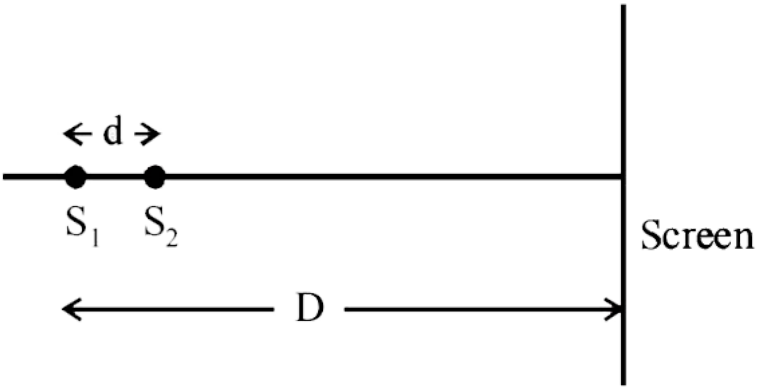
**12.** Two coherent point sources $S_1$ and $S_2$ are separated by a small distance $d$ as shown. The

fringes obtained on the screen will be




A. semi-circles

B. Concentric circles

C. points

D. straight lines

**Answer: B**

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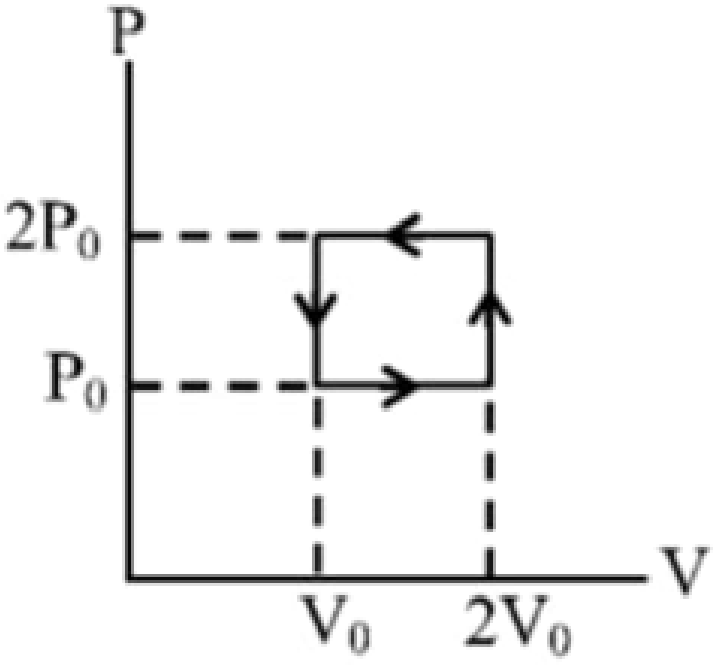
**13.** In the figure shown below, an ideal gas is carried around the cyclic process. How much work is done in one cycle if

$P_0 = 8atm$ and $V_0 = 7.00$ litre?




A. 5656 J

B. $-5656J$

C. $10600J$

D. $11300J$

**Answer: B**

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**14.** One litre of oxygen at a pressure of 1 atm and two litres of nitrogen at a pressure of 0.5 atm are introduced into a vessel of volume 1 litre. If there is no change in temperature, the final pressure of the mixture of gas (in atm) is

A. 1.5

B. 2.5

C. 2

D. 4

**Answer: C**

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**15.** A coil having $200$ turns has a surface area of $0.15m^2$. A magnetic field of strength $0.2T$ applied perpendicular to this changes to $0.6T$ in $0.4s$, then the induced emf in the coil is _____V.

A. 45

B. 30

C. 15

D. 60

**Answer: B**

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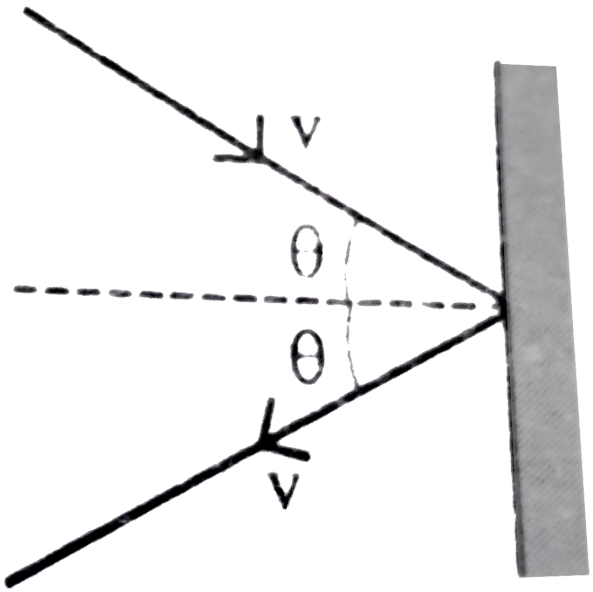
**16.** A jet water, whose cross section is $A$ strikes a wall making an angle $\theta$ with normal and elastically rebounds. The velocity of water of

density $\rho$ is $v$. Force exerted on wall is :-




A. $2Av^2\rho$

B. $Av^2\rho$

C. $2Av^2\rho\sin\theta$

D. $2Av^2\rho\cos\theta$

**Answer: D**

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**17.** A sound wave of frequency $f$ propagating through air with a velocity $c$, is reflected from a surface which is moving away from the source with a constant speed $v$. Find the frequency of the reflected wave, measured by the observer at the position of the source.

A. $\frac{f(c-v)}{c+v}$

B. $\frac{f(c-v)}{c-v}$

C. $\frac{f(c+2v)}{c+v}$

D. $\frac{f(c-v)}{c-2v}$

**Answer: A**

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**18.** Two men $A$ and $B$ are carrying a uniform bar of length $L$ on their shoulders. The bar is held horizontally such that A gets one-fourth

load. If $A$ is at one end of the bar, the distance of $B$ from that end is

A. $\frac{L}{3}$

B. $\frac{L}{4}$

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

D. $\frac{3L}{4}$

**Answer: A**

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**19.** A body is falling under gravity . When it loses a gravitational potential energy $U$, its speed is $v$. The mass of the body shell be

A. $2U/v^2$

B. $2v/U^2$

C. $2v/U$

D. $U^2/2v$

**Answer: A**

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**20.** Dimensional formula of magnetic field is :-

A. $\left[MT^{-2}A^{-1}\right]$

B. $\left[ML^{2}T^{-1}A^{-2}\right]$

C. $\left[MT^{-2}A^{-2}\right]$

D. $\left[MT^{-1}A^{-2}\right]$

**Answer: A**

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**21.** Two particles are projected simultaneously in the same vertical plane, with speed $u_1$ and $u_2$ at angle of projection $\theta_1$ and $\theta_2$ respectively with the horizontal. The path followed by one, as seen by other (as long as both are in flight), is

A. a vertical line

B. a parabola

C. a hyperbola

D. a straight line making a constant angle with the horizontal

**Answer: D**

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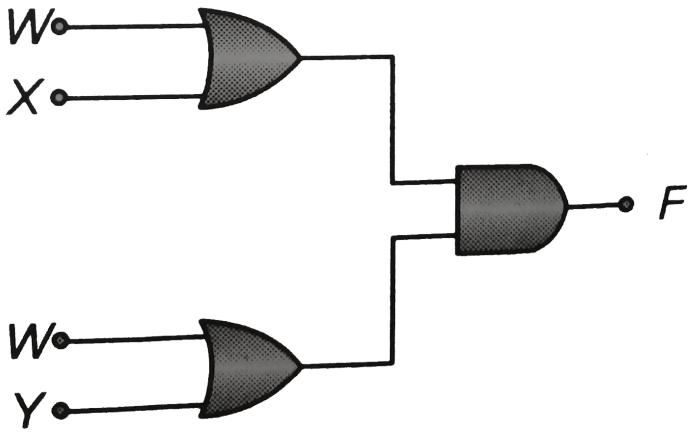
**22.** The diagram of a logic circuit is given below. The output $F$ of the circuit is

represented by




A. $P + R \cdot Q$

B. $P \cdot (R \cdot Q)$

C. $P \cdot (R + Q)$

D. $P + (R + Q)$

**Answer: A**

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**23.** A fully charged capacitor has a capacitance $C$. It is discharged through a small coil of resistance wire embedded in a thermally insulated block of specific heat capacity $s$ and mass $m$. If the temperature of the block is raised by $\Delta T$, the potential difference $V$ across the capacitance is

A. $\sqrt{\frac{2ms\Delta T}{8}}$

B. $\frac{ms\Delta T}{8}$

C. $\frac{ms\Delta T}{C}$

D. $\sqrt{\frac{2ms\Delta T}{C}}$

**Answer: D**

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**24.** The instantaneous current and volatage of an AC circuit are given by

$i = 10\sin(314t)A$ and $V = 100\sin(314t)V$

What is the power dissipation in the circuit?

A. 1000 W

B. 500 W

C. 300 W

D. 200 W

**Answer: B**

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**25.** An object is approaching a convex lens of focal length 0.3m with a speed of $0.01ms^{-1}$. Find the magnitudes of the ratio of change of

position and lateral magnification of image when the object is at a distance of 0.4m from the lens

A. 0.3

B. 0.6

C. 0.15

D. $-0.3$

**Answer: A**

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**26.** A bimetallic is made of two strips A and B having coefficients of linear expansion $\alpha_4$ and $\alpha_B$. If $\alpha_A < \alpha_B$, then on heating, the strip will

A. Bend with A on outer side

B. Bend with B on outer side

C. Not bend at all

D. None of the above

**Answer: B**

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**27.** A wire of natural length $l$, young's modulus Y and area of cross-section A is extended by x. Then, the energy stored in the wire is given by

A. $\frac{1}{2}\frac{YA}{l}x^2$

B. $\frac{1}{3}\frac{YA}{l}x^2$

C. $\frac{1}{2}\frac{Yl}{A}x^2$

D. $\frac{1}{2}\frac{A}{Yl}x^2$

**Answer: A**

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**28.** A copper disc of radius 0.1 m is roated about its centre with 20 revolutions per second in a uniform magnetic field of 0.1 T with its plane perpendicular the field. The emf induced across the radius of disc is

A. $\frac{\pi}{20}$ volt

B. $\frac{\pi}{10}$ volt

C. $20\pi$ millivolt

D. $100\pi$ millivolt

**Answer: C**

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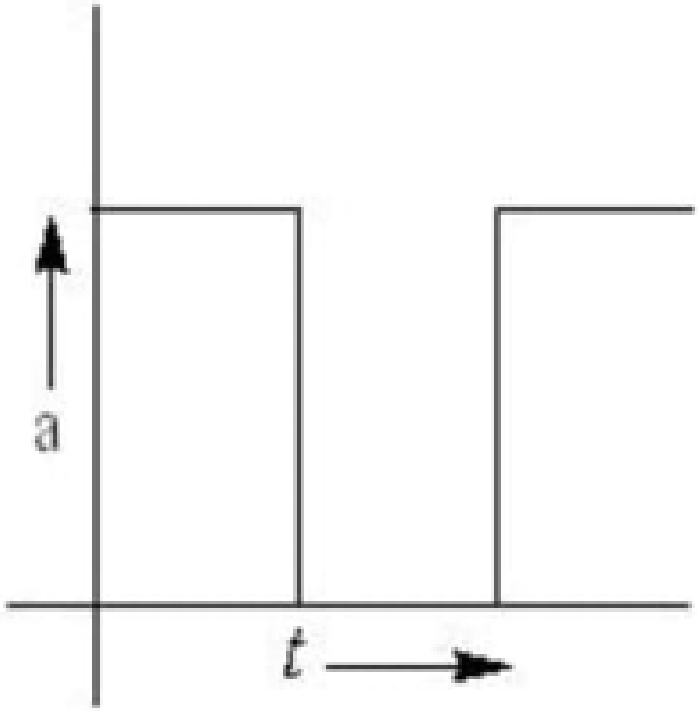
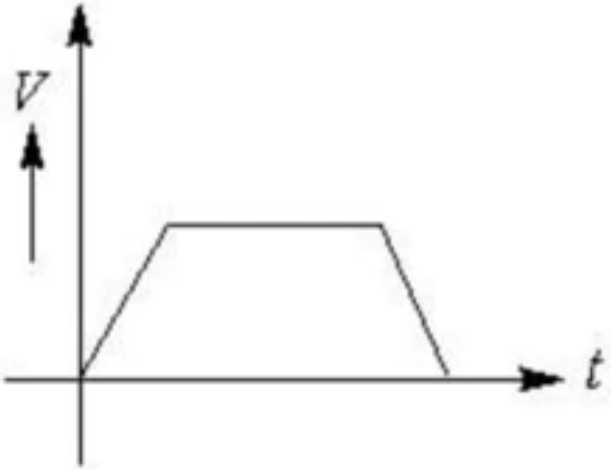
**29.** Figure shows the acceleration-time graphs of a particle. Which of the following

represents the corresponding velocity -time

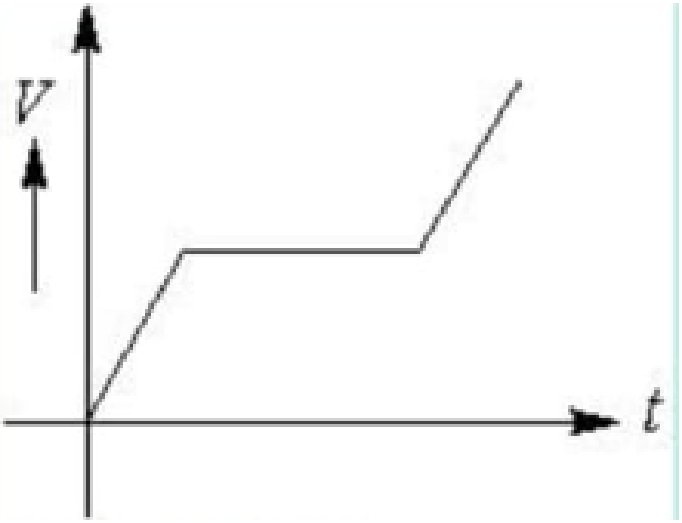



graph?

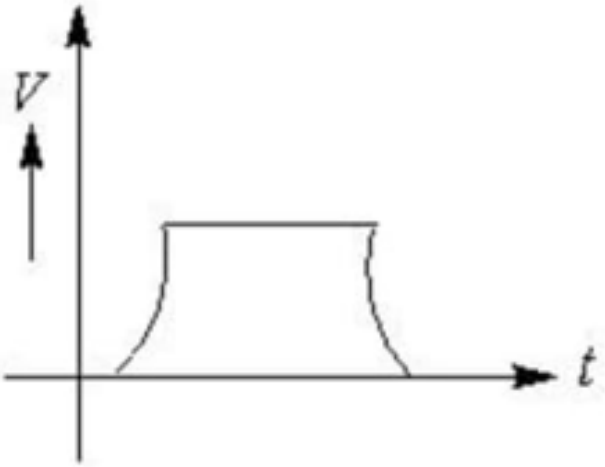
A.



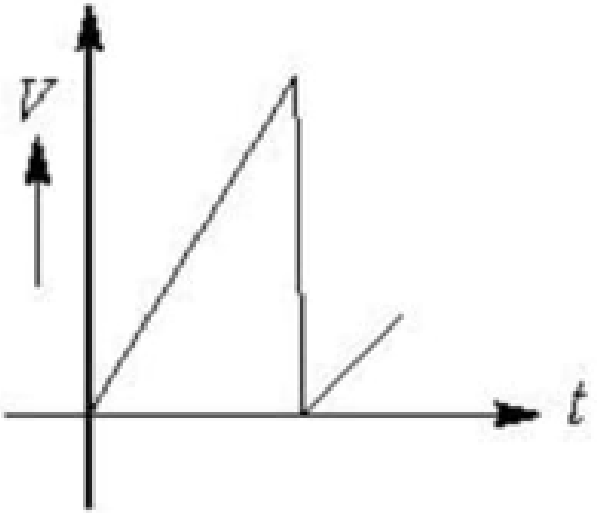

B.



C.




D.




**Answer: B**

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**30.** A single slit of width b is illuminated by a coherent monochromatic light of wavelength $\lambda$. If the second and fourth minima in the diffraction pattern at a distance 1 m from the slit are at 3 cm and 6 cm respectively from the central maximum, what is the width of the central maximum ? (i.e., distance between first minimum on either side of the central maximum)

A. 4.5 cm

B. 1.5 cm

C. 6.0 cm

D. 3.0 cm

**Answer: D**

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**31.** A given quantity of a ideal gas is at pressure P and absolute temperature T. The isothermal bulk modulus of the gas is

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

B. $P$

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

D. $2P$

**Answer: B**

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**32.** The radiation emitted by a star A is 10,000 times that of the sun. If the surface temperatures of the sun and the star A are

8000 K and 2000 K respectively. The ratio of the radii of the star A and the sun is

A. $1600:1$

B. $1800:1$

C. $16:1$

D. $25:1$

**Answer: A**

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**33.** How many times larger is the spacing between the energy levels with n=3 and n=4,then the spacing between the energy levels with n=8 and n=9 for a hydrogen like atom or ion?

A. 0.71

B. 0.41

C. 2.43

D. 14.82

**Answer: B**

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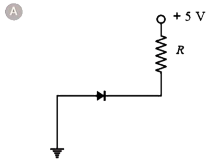
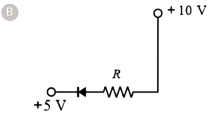
**34.** In the following, which one of the diodes is reverse biased ?

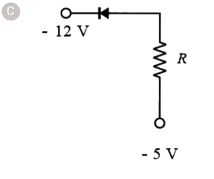
A.



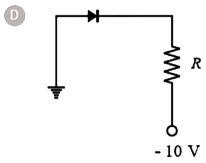

B.




C.



D.




**Answer: A**

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**35.** A bar magnet suspended in magnetic meridian executes oscillations with a time period of $2$ sec in the earth's horizontal magnetic field of $24$ microtesla. When a horizontal field of $18$ microtesla is produced opposite to the earth's field by placing a

current carrying wire, the new time period of magnet will be:

A. 1 s

B. 2 S

C. 3 S

D. 4 s

**Answer: D**

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**36.** Three cells of emf 1 V and iternal resistance $1\Omega$ each are connected as shown. Effective emf of combination between the points P and Q is-

A. Zero

B. 1 V

C. 2 V

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

**Answer: A**

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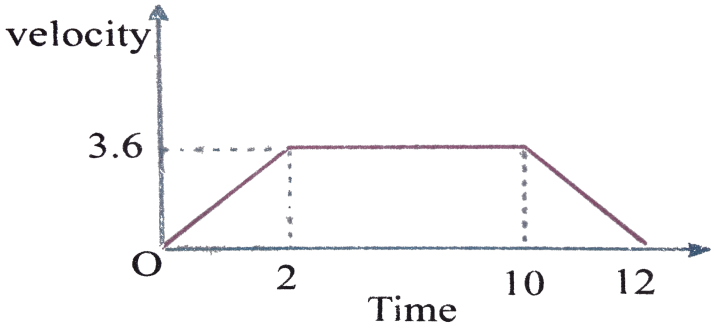


**37.**

An elevator is going up. The variation in the velocity of the elevator is as given in the graph. What is the height to which the elevator takes the passenger?

A. 3.6 m

B. 28.8 m

C. 36.0 m

D. 32.4 m

**Answer: C**

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**38.** When the angle of incidence on a material is $60^\circ$, the reflected light is completely polarized. The velocity of the refracted ray inside the material is (in $ms^{-1}$)

A. $3 \times 10^8$

B. $\left(\frac{3}{\sqrt{2}}\right) \times 10^8$

C. $\sqrt{3} \times 10^8$

D. $0.5 \times 10^8$

**Answer: C**

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**39.** When monochromatic radiation of intensity I falls on a metal surface, the number of photoelectrons and their maximum kinetic are N and T respectively. If the intensity of

radiation is 2 I, the number of emitted electrons and their maximum kinetic energy are respectively.

A. N and 2 T

B. 2 N and T

C. 2N and 2T

D. N and T

**Answer: B**

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**40.** A transformer of efficiency 90% has turns ratio 10 : 1. If the voltage across the primary is 220 V and current in the primary is 0.5 A, then the current in secondary is

A. 5.5 A

B. $5A$

C. $4A$

D. 4.5 A

**Answer: D**

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**41.** Three particles start from the origin at the same time, one with a velocity $v_1$ along the x-axis, second along the negative y-axis with a velocity $v_2$ and third particle moves along the line x = y. The velocity of third particle, so that three may always lie on the same line is:

A. $\frac{v_1 + v_2}{2}$

B. $\sqrt{v_1 + v_2}$

C. $\frac{v_1 v_2}{v_1 + v_2}$

D. $v = \frac{\sqrt{2} v_1 v_2}{v_1 - v_2}$

**Answer: D**

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**42.** A laser beam is sent to the moon and reflected back to earth by a mirror placed on the moon by an astronaut. If the moon is at 3,84,000 km distance from earth, how long does it take the light to make the round trip?

A. 5 min

B. 2.5 min

C. 2.5 s

D. 500 s

**Answer: C**

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**43.** The wheel of a toy car rotates about a fixed axes. It slows down from 400 rps to 200 rps in 2 s. Then, its angular retardation in $\mathrm{rad\,s^{-2}}$ is (rps = revolutions per second)

A. $200\pi$

B. $100\pi$

C. $400\pi$

D. None of these

**Answer: A**

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**44.** The resultant of two vectors at right angles is 5 N. If the angle between them is

$120^\circ$ and the resultant is $\sqrt{13}$ then the magnitude of vectors are

A. $\sqrt{12}N, \sqrt{13}N$

B. $\sqrt{20}N, \sqrt{5}N$

C. $3N, 4N$

D. $\sqrt{40}N, \sqrt{15}N$

**Answer: C**

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**45.** An electron having kinetic energy 10eV is circulating in a path of radius 0.1 m in an external magnetic field of intensity $10^{-4}$T. The speed of the electron will be

A. $2 \times (10^6) ms^{-1}$

B. $4.8 \times (10^6) ms^{-1}$

C. $2.0 \times (10^{12}) ms^{-1}$

D. $4.8 \times (10^{12}) ms^{-1}$

**Answer: A**

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