doubtnut
India's Number 1 Education App

PHYSICS

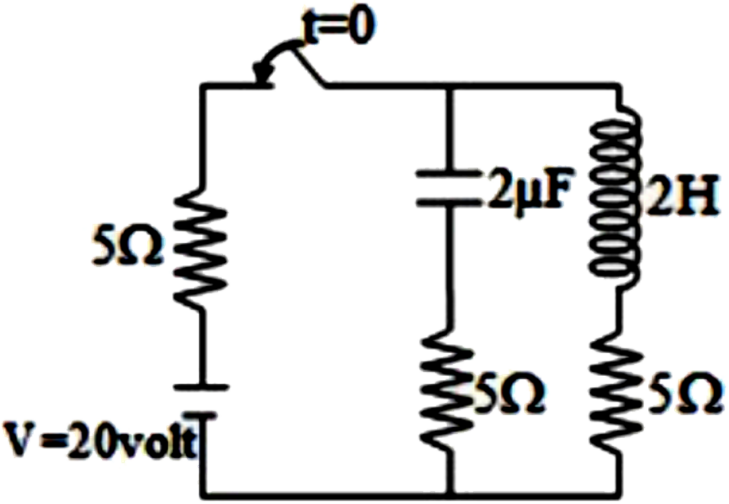
BOOKS - NTA MOCK TESTS

NTA NEET SET 52

Physics

1. Calculate the ratio of current flowing through the battery at t = 0 and $t = \infty$ (t = 0

is the time of closing of the switch)



A. 1

B. 2

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

D. 0

Answer: A

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2. A bar magnet 8 cm long is placed in the magnetic merdian with the N-pole pointing towards geographical north . Two netural points separated by a distance of 6 cms are obtained on the equatorial axis of the magnet . If horizontal component of earth's field $= 3.2 \times 10^{-5} T,$ then pole strength of magnet is

A. 0.5 A m

B. 1 A m

C. 0.25 A m

D. 2 A m

Answer: A

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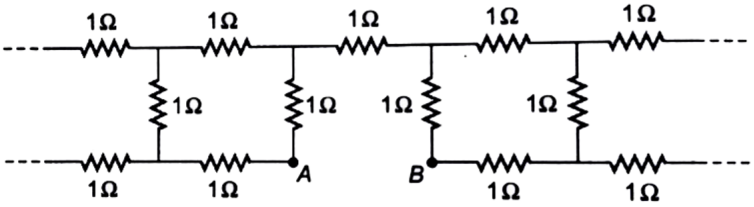
3. Shown in the figure is an infinite network of resistors each of resistance 1Ω . The effective

resistance in between A and B is



A. Less than 1Ω

B. 1Ω

C. More than 1Ω but less than 3Ω

D. 3Ω

Answer: C

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4. The wire of potentiometer is made of

A. copper

B. steel

C. manganin

D. aluminum

Answer: C

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5. In a series LCR circuit the frequency of a $10V$, AC voltage soure is adjusted in such a fashion that the reactance of the inductor meausers 15Ω and that of the capacitor 11Ω. If $R = 3\Omega$, the potentail difference across the series combination of L and Cwill be:

A. 8 V

B. 10 V

C. 22 V

D. 52 V

Answer: A

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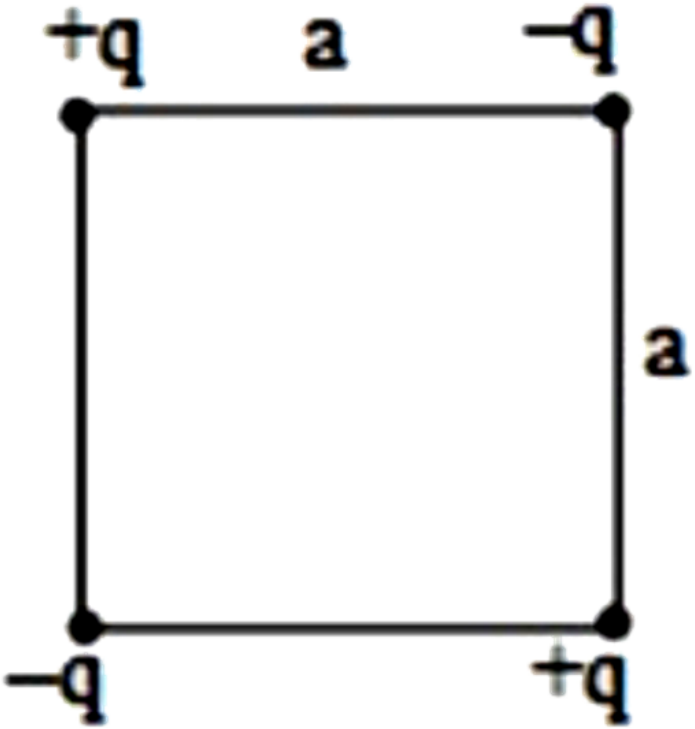
6. The work required to put the four charges from infinity to the position shown here is



A. $\frac{0.65q^2}{\pi\varepsilon_0 a}$

B. $\frac{-1.0q^2}{\pi\varepsilon_0 a}$

C. $\frac{\left(1-\frac{1}{2\sqrt{2}}\right)q^2}{\pi\varepsilon_0 a}$

D. zero

Answer: A

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7. The capacitance of a parallel plate condenser does not depend upon

A. the distance between the plates

B. area of the plates

C. medium between the plates

D. metal of the plates

Answer: D

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8. A stream of electrons is projected horizontally to the right. A straight conductor carrying a current is supported parallel to the electron steam and above it. If the current in the conductor is from left to right, what will be the effect on the electron stream?

A. the electron stream will be pulled upwards

B. the electron stream will be pulled downwards

C. the electron stream

D. the electron stream will be speeded up towards the right

Answer: B

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9. The magnetic field B due to a current carrying circular loop of radius $12cm$ at its centre is $0.5 \times 10^{-4}T$. Find the magnetic field due to this loop at a point on the axis at a distance of $5.0cm$ from the centre.

A. $3.5 \times 10^{-9}T$

B. $5.3 \times 10^{-9}T$

C. $9.3 \times 10^{5}T$

D. $3.9 \times 10^{-5}T$

Answer: D

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10. A body cools from $50^\circ C$ to $40^\circ C$ in 5 min. If the temperature of the surrounding is $20^\circ C$, the temperature of the body after the next 5 min would be

A. $36^\circ C$

B. $35^\circ C$

C. $33.33^\circ C$

D. $30^\circ C$

Answer: C

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11. In the diagram, the graph between volume and pressure for a thermodynamical process in shown. If $U_A = 0, U_B = 20J$ and the energy given from B to C is 30J, then at the stage of C, the internal energy of the system is

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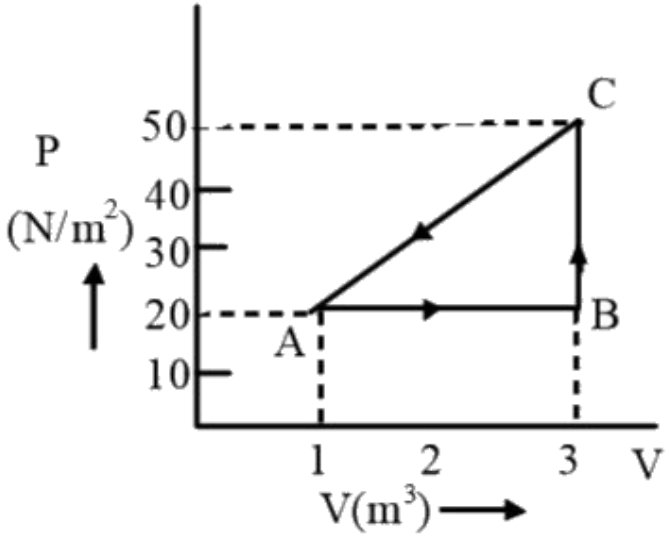

A. 50 J

B. 60 J

C. 30 J

D. 10 J

Answer: A

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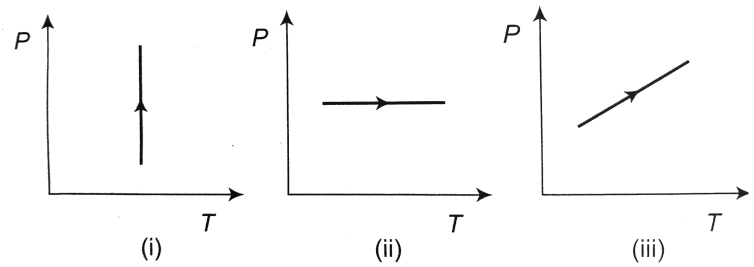
12. Pressure versus temperature graphs of an ideal gas are as shown in figure. Choose the wrong statement



A. density of gas increasing in graph (i)

B. density of gas is decreasing in graph (ii)

C. density of gas is constant in graph (iii)

D. none of these

Answer: D

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13. Value of adiabatic bulk modulus of elasticity of helium at NTP is

A. $1.01 \times 10^5 Nm^{-2}$

B. $1.01 \times 10^{-5} Nm^{-2}$

C. $1.69 \times 10^{5} Nm^{-2}$

D. $1.69 \times 10^{-5} Nm^{-2}$

Answer: C

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14. A copper rod and a steel rod maintain a difference in their lengths of 10 cm at all temperature . If their coefficients of expansion

are $1.6 \times 10^{-5} K^{-1}$ and $1.2 \times 10^{-5} K^{-1}$,

then length of the copper rod is

A. 40 cm

B. 30 cm

C. 32 cm

D. 24 cm

Answer: B

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15. Steam is passed into $54gm$ of water at $30^\circ C$ till the temperature of mixture becomes $90^\circ C$. If the latent heat of steam is $536cal/gm$, the mass of the mixture will be

A. 80 g

B. 60 g

C. 50 g

D. 24 g

Answer: B

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16. A string of length 2x is stretched by 0.1 x and the velocity of a transverse wave along it is v. When it is stretched by 0.4x , the velocity of the wave is

A. $\sqrt{\frac{5}{6}}v$

B. $\sqrt{\frac{11}{7}}v$

C. $\sqrt{\frac{32}{7}}v$

D. $\sqrt{\frac{27}{6}}v$

Answer: C

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17. A car starts from rest and moves with uniform acceleration a on a straight road from time $t = 0$ to $t = T$. After that, a constant deceleration brings it to rest. In this process the average speed of the car is

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

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

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

D. aT

Answer: C

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18. A body is thrown from a point with speed $50ms^{-1}$ at an angle 37° with horizontal . When it has moved a horizontal distance of 80 m then its distance from point of projection is

A. 40 m

B. $40\sqrt{2}m$

C. $40\sqrt{5}m$

D. none

Answer: C

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19. A force $F = 2t^2$ is applied to the cart initially at rest. The speed of the cart at t = 5 s

is -

A. $10ms^{-1}$

B. $8.33ms^{-1}$

C. $2ms^{-1}$

D. zero

Answer: B

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20. The coefficient of restitution for a body is $e = \frac{1}{3}$. At what angle the body must be incident on a perfectly hard plane so that the angle between the direction before and after the impact be at right angles:

A. 37°

B. 60°

C. 45°

D. 30°

Answer: D

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21. Two identical blocks each of mass 1kg are joined together with a compressed spring. When the system is released the two blocks appear to be moving with unequal speeds in the opposite directions as shown in fig.

Choose the correct statement -

A. it is not possible

B. whatever may be the speed of the blocks the centre of mass will remain stationary

C. the centre of mass of the system is moving with a velocity of $2ms^{-1}$

D. the centre of mass of the system is moving with a velocity of $1ms^{-1}$

Answer: D

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22. A stationary pulley carries a rope whose one end supports a ladder with a man and the other end the counterweight of mass M. The man of mass m climbs up a distance l' with respect to the ladder and then stops. Neglecting the mass of the rope and the friction in the pulley axle, find the displacement I of the centre of inertia of this system.

A. $\frac{ml}{M+m}$

B. $\frac{ml}{2M}$

C. $\frac{ml}{M+2m}$

D. $\frac{ml}{2M+m}$

Answer: B

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23. A ball of mass in moving with speed u undergoes a head-on elastic collision with a ball of mass nm initially at rest. The fraction of the incident energy transferred to the second ball is

A. $\frac{n}{1+n}$

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

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

D. $\frac{4n}{(1+n)^2}$

Answer: D

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24. The angular position of a line of a disc of radius r = 6cm is given by $\theta = 10 - 5t + 4t^2$

rad , the average angular velocity between 1 and 3s is

A. $\pi \text{rad} \quad s^{-1}$

B. $11 \text{rad} \quad s^{-1}$

C. $22 \text{rad} \quad s^{-1}$

D. $5.5 \text{rad} \quad s^{-1}$

Answer: B

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25. The total energy of a satellite is

A. always positive

B. always negative

C. always zero

D. positive or negative depending upon radius of orbit

Answer: B

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26. A small block of super dense material has mass $2 \times 10^{24} kg$. It is at a height $h << R$. It falls towards the earth.Find its speed when it is at a height $\frac{h}{2}$

A. $\sqrt{\frac{2gh}{3}}$

B. $\sqrt{\frac{3gh}{4}}$

C. $\sqrt{\frac{3gh}{5}}$

D. $\sqrt{\frac{gh}{2}}$

Answer: B

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27. A student says that he had applied a force $F = -k\sqrt{x}$ on a particle and the particle moved in simple harmonic motion. He refuses to tell whether k is a constant or not. Assume that he has worked only with positive x and no other force acted on the particle

A. as x increase k increase

B. as x increase k decrease

C. as x increase and k remains constant

D. the motion cannot be simple harmonic

Answer: A

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28. A pendulum of length 10 cm is hanged by a wall making an angle 3° with vertical. It is swung to position B. Time period of pendulum will be

A. $\frac{\pi}{5}s$

B. $\frac{2\pi}{15}s$

C. $\frac{\pi}{6}s$

D. subsequent motion will not be periodic

Answer: B

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29. A simple harmonic oscillator has amplitude A, angular velocity ω, and mass m . Then, average energy in one time period will be

A. $\frac{1}{2}m\omega^2 A^2$

B. $\frac{1}{4}m\omega^2 A^2$

C. $m\omega^2 A^2$

D. zero

Answer: B

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30. A $20N$ metal block is suspended by a spring balance. A beaker containing some water is placed on a weighing machine which reads $40N$. The spring balance is now lowered

so that the block gets immersed in the water. The spring balance now reads $16N$. The reading of the weighing machine will be.

A. 36 N

B. 60 N

C. 44 N

D. 56 N

Answer: C

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31. A metal wire of density ρ floats on water surface horozontally. If is NOT to sink in water, then maximum radius of wire is proportional to (where, T=surface tension of water, g=gravitational acceleration)

A. $\sqrt{\frac{2T}{\pi\rho g}}$

B. $\sqrt{\frac{4T}{\pi\rho g}}$

C. $\sqrt{\frac{T}{\pi\rho g}}$

D. $\sqrt{\frac{T\rho}{\pi g}}$

Answer: A

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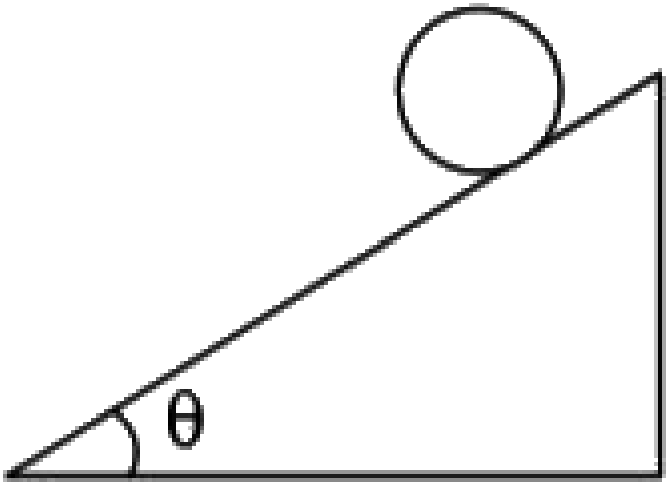
32. A spherical shell of radius R is rolling down an incline of inclination θ without slipping. Find minimum value of coefficient of friction.



A. $\frac{2}{7}\tan\theta$

B. $\frac{2}{5}\tan\theta$

C. $\frac{2}{3}\tan\theta$

D. none of these

Answer: B

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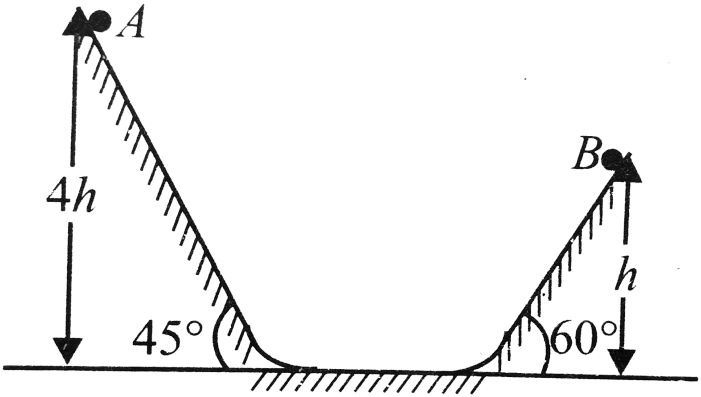
33. Two identical balls A and B are released from the position shown in Fig. They collide elastically with each other on the horizontal portion. The ratio of heights attained by A

and B after collision is (neglect friction)



A. $1:4$

B. $2:1$

C. $4:13$

D. $2:5$

Answer: C

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34. The angular momentum of an electron in a hydrogen atom is proportional to

A. $\frac{1}{\sqrt{r}}$

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

C. $\sqrt{r}$

D. r^2

Answer: C

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35. The radius of electron's second stationary orbit in Bohr's atom is R. The radius of the third orbit will be

A. 3R

B. 2.25R

C. 9R

D. $\frac{R}{3}$

Answer: B

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36. The ratio of radii of nuclei $._{13}A1^{27}$ and $._{52}X^{A}$ is $3:5$. The number of neutrons in the nuclei of X will be

A. 52

B. 73

C. 125

D. 13

Answer: B

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37. When a surface 1 cm thick is illuminated with light of wavelength λ, the stopping potential is V_0, but when the same surface is illuminated by light of wavelength 3λ, the stopping potential is $\frac{V_0}{6}$. Find the threshold wavelength for metallic surface.

A. 4λ

B. 5λ

C. 3λ

D. 2λ

Answer: B

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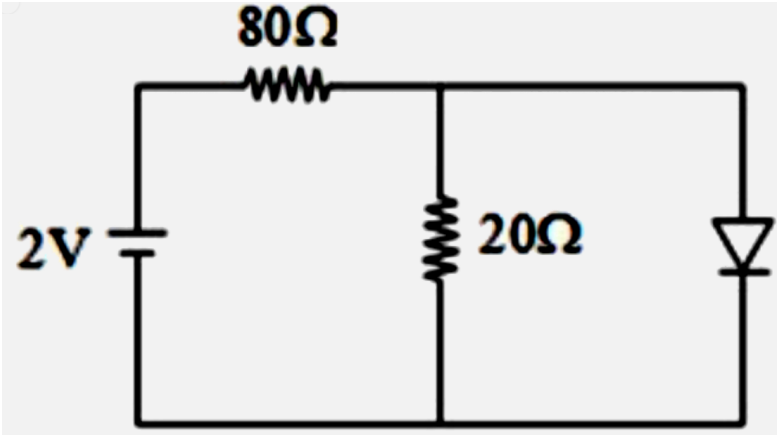
38. In the circuit shown, the current through the ideal diode is



A. 75 mA

B. 20 mA

C. 100 mA

D. 25 mA

Answer:

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39. The truth table given below is for :-

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	1

A. $Y = \overline{A}B + \overline{\overline{A}B}$

B. $Y = \overline{A}\,\overline{B} + A\overline{B}$

C. $Y = \overline{A}\,\overline{B} + \overline{\overline{A}B}$

D. $Y = \overline{A}\,\overline{B} + AB$

Answer: D

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40. If l_1, l_2, l_3 are the lengths of the emitter, base and collector of a transistor then

A. $l_1 = l_2 = l_3$

B. $l_3 < l_2 > l_1$

C. $l_3 < l_2 < l_1$

D. $l_3 > l_1 > l_2$

Answer: D

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41. The relation between α and β parameters of current gains for a transistors is given by

A. $\alpha + \frac{1+\beta}{\beta}$

B. $\alpha + \frac{1-\beta}{\beta}$

C. $\alpha = \frac{\beta}{1+\beta}$

D. $\alpha = \frac{\beta}{1-\beta}$

Answer: C

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42. If the critical angle for total internal reflection from a medium to vacuum is 30°, the velocity of light in the medium is

A. $3 \times 10^8 ms^{-1}$

B. $1.5 \times 10^8 ms^{-1}$

C. $6 \times 10^8 ms^{-1}$

D. $\sqrt{3} \times 10^8 ms^{-1}$

Answer: B

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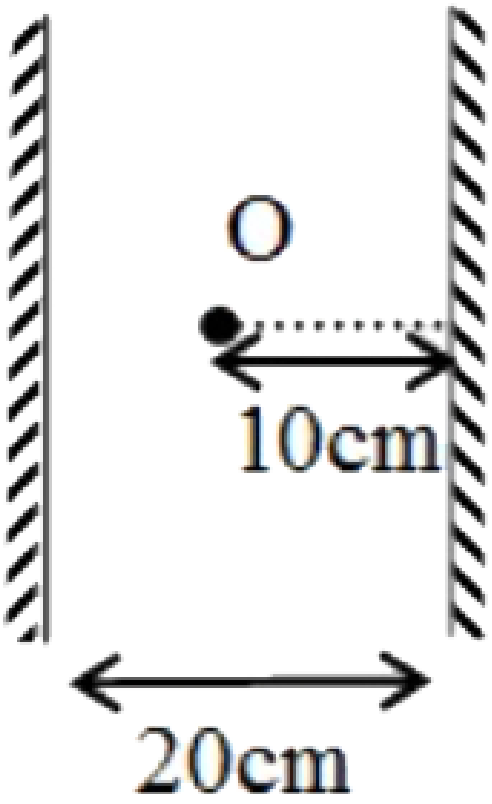
43. Two plane mirrors are kept parallel at 20 cm from each other. A point object O is placed exactly in between them. Calculate distance

between second images formed by two mirros.



A. 80 cm

B. 60 cm

C. 40 cm

D. 10 cm

Answer: A

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44. A beam of light of wavelength 600 nm from a distant source falls on a single slit 1 mm wide and the resulting diffraction pattern is observed on a screen 2 m away. The distance

between the first dark fringes on either side of the central bright fringe is

A. 1.2 cm

B. 1.2 mm

C. 2.4 cm

D. 2.4 mm

Answer: D

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45. An unpolarised beam of intensity I_0 is incident on a pair of nicols making an angle of 60° with each other. The intensity of light emerging from the pair is

A. I_0

B. $\frac{I_0}{2}$

C. $\frac{I_0}{4}$

D. $\frac{I_0}{8}$

Answer: D

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