



## PHYSICS

### BOOKS - NTA MOCK TESTS

#### NEET MOCK TEST 11

##### Physics

1. the energy required to excite an electron in hydrogen atom to its first excited state is

A. 10.2 eV

B. 5.1 eV

C. 3.4 eV

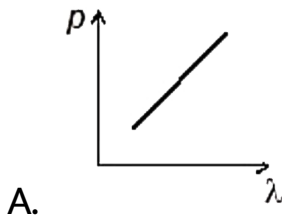
D. 6.8 eV

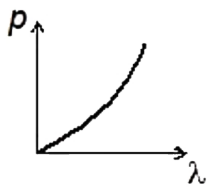
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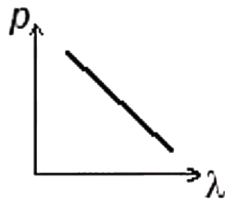
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2. Which of the following figure represents the variation of particle momentum and the associated de - Broglie wavelength ?

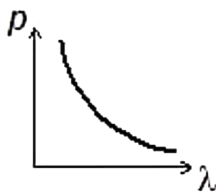




B.



C.



D.

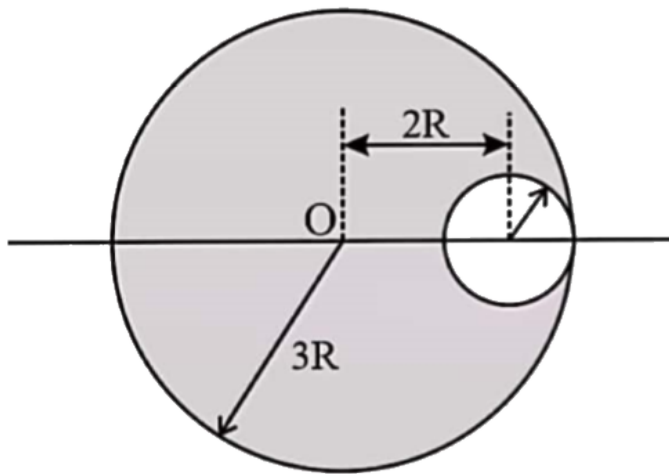
**Answer:**



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3. The figure shows a disc of radius  $3R$  from which a circular hole of radius  $R$  is cut as shown in the figure.

The distance of the centre of mass of the remaining object from the point O is



A.  $R/4$

B.  $R/5$

C.  $R/3$

D.  $R/6$

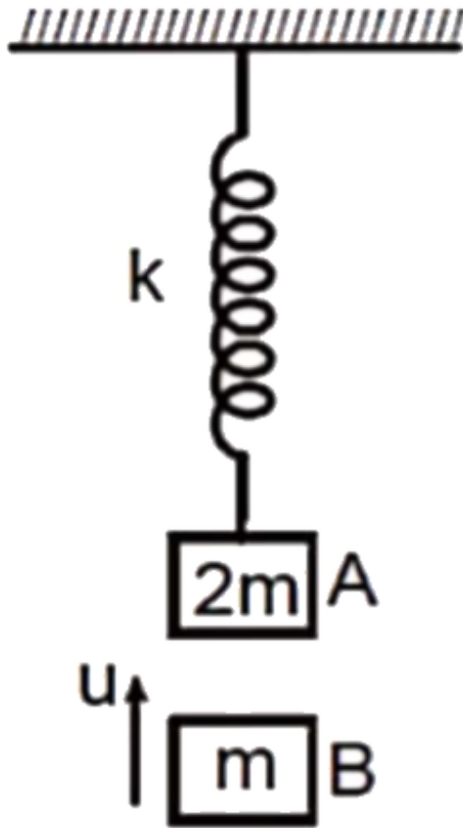
**Answer:**



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4. A block A of mass  $2m$  is hanging from a vertical massless spring of spring constant  $k$  and is in equilibrium. Another block B of mass  $m$  strikes the block A with velocity  $u$  and sticks to it as shown in the figure. The magnitude of the acceleration of the combined

system of the blocks just after the collision is



A.  $g/2$

B.  $g/3$

C.  $g$

D. zero

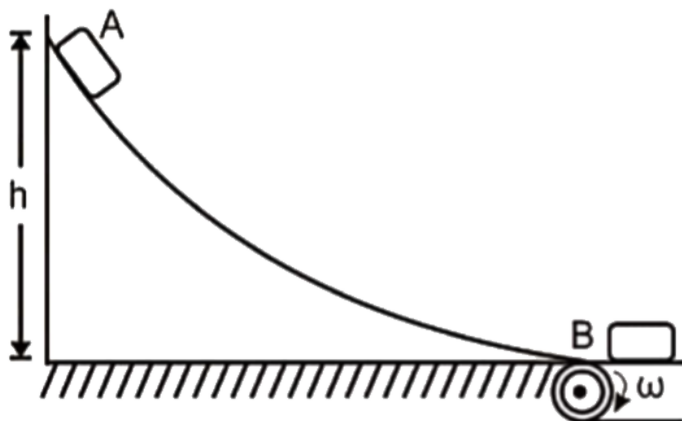
**Answer:**



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5. A block A starts sliding on a smooth track from a height  $h$  as shown in the figure. The track smoothly joins into a conveyor belt which is being driven by a pulley of radius  $r$ . If the angular velocity  $\omega$  of the pulley is such that the block A doesn't slip on the belt, the value

of  $\omega$  is



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

B.  $\frac{\sqrt{hg}}{2r}$

C.  $\frac{\sqrt{2gh}}{r}$

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

**Answer:**



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6. If a copper rod (free to move and rotate) is brought in a region of a non-uniform magnetic field, then it will align itself

A. Along the direction of the magnetic field, at a location where the magnetic field is strongest

B. along the direction of the magnetic field, at a location where the magnetic field is weakest

C. perpendicular to the direction of the magnetic field, at a location where the magnetic field is strongest

D. perpendicular to the direction of the magnetic field, at location where the magnetic field is weakest

**Answer:**



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7. In a house 15 Bulbs of 45 W, 15 bulbs of 100 W, 15 bulbs of 10 W and Two heaters of 1 KW each is connected to 220 V Mains supply then find minimum fuse current

A. 20A

B. 15A

C. 10A

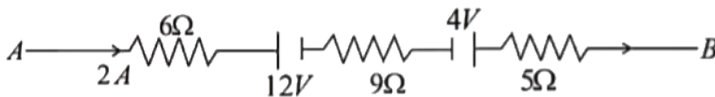
D. 25A

**Answer:**



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**8.** The voltage drop between the points A and B in the given figure is



A. 24V

B. 14V

C. 32V

D. 48V

**Answer:**



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9. A charged  $30\mu F$  capacitor is connected to a 27mH inductor.

What is the angular frequency of free oscillations of the circuit?

A.  $9.1 \times 10^3 rad \ s^{-1}$

B.  $3 \times 10^3 \text{ rad s}^{-1}$

C.  $1.1 \times 10^3 \text{ rad s}^{-1}$

D.  $0.3 \times 10^3 \text{ rad s}^{-1}$

**Answer:**



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**10.** In an AC circuit, a resistance of  $R \text{ ohm}$  is connected in series with an inductance  $L$ . If phase angle between voltage and current be  $45^\circ$ , the value of inductive reactance will be

A.  $R/4$

B.  $R/2$

C.  $R$

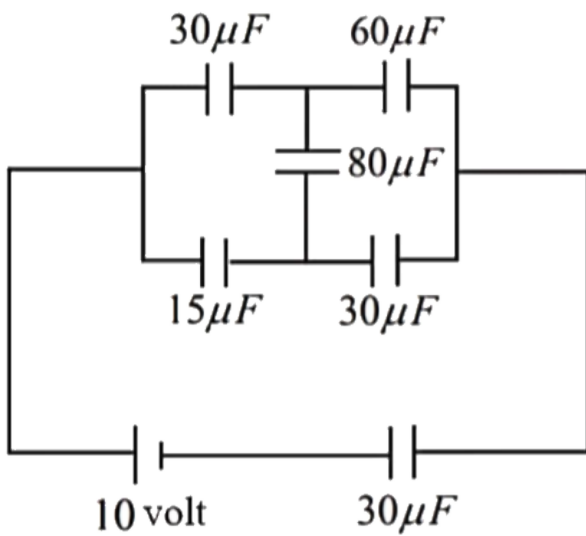
D.  $R/8$

**Answer:**



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**11.** In the circuit shown below, the charge on the  $60\mu F$  capacitor is



A.  $150\mu C$

B.  $100\mu C$

C.  $50\mu C$

D.  $75\mu C$

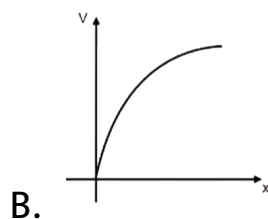
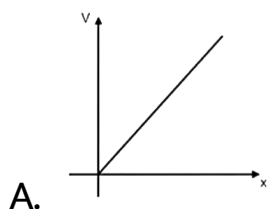
**Answer:**



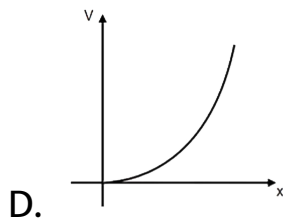
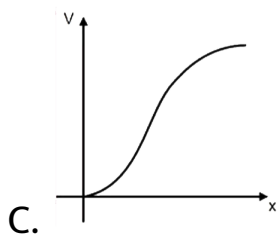
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**12.** In a uniform electric field, a point charge of mass  $m$  and charge  $q$  is released from rest. If there are no other forces acting on the particle, then which of the following graphs, correctly show the dependence of the particles speed  $v$  on the distance  $x$  travelled by the particles speed  $v$  on the distance  $x$  travelled by it?

[Graphs are schematic and not drawn to scale]







**Answer:**



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**13.** One division on the main scale has 20 equal divisions which match with 16 main scale division. The least count of the vernier calipers is

A. 0.02mm

B. 0.2mm

C. 0.8mm

D. 0.08mm

**Answer:**



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**14.** A body is projected up with a velocity equal to  $\sqrt{\frac{9GM}{8R}}$ , where M is the mass of the earth and R is the radius of the earth. The maximum distance it reaches from the centre of the earth is

A.  $\frac{10R}{9}$

B.  $\frac{16R}{7}$

C.  $\frac{10R}{3}$

D.  $\frac{9R}{8}$

**Answer:**



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**15.** The acceleration due to gravity at a depth  $R/2$  below the surface of the earth is

A.  $g$

B.  $2g$

C.  $g/2$

D.  $g/4$

**Answer:**



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**16.** A spherical black body with a radius of  $12\text{cm}$  radiates  $450\text{W}$  power at  $500\text{K}$ . If the radius were halved and the temperature doubled, the power radiated in watt would be

A.  $3600\text{W}$

B.  $450\text{ W}$

C.  $900\text{W}$

D. 1800W

**Answer:**



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17. The temperature of an ideal gas undergoing adiabatic expansion varies with volume as  $T \propto V^{-\frac{3}{4}}$ , then the value of  $\frac{C_P}{C_V}$  for the gas is

A.  $\frac{3}{5}$

B.  $\frac{5}{3}$

C.  $\frac{7}{3}$

D.  $\frac{7}{4}$

**Answer:**



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**18.** The specific heats,  $C_P$  and  $C_V$  of a gas of diatomic molecules, A are given (in units of  $Jmol^{-1}K^{-1}$ ) by 29 and 22, respectively. Another gas of diatomic molecules, B has the corresponding values 30 and 21. If they are treated as ideal gases, then :

A. A has one vibrational degree of freedom and B

has two vibrational degrees of freedom

B. A has one vibrational degree of freedom and B

has zero vibrational degree of freedom

C. A and B both have one vibrational degree of freedom

D. A and B both have two vibrational degrees of freedom

**Answer:**



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**19.** In an isobaric process, heat is supplied to a monoatomic ideal gas. The fraction of heat that goes into mechanical work is

A. 1

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

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

D.  $\frac{2}{5}$

**Answer:**

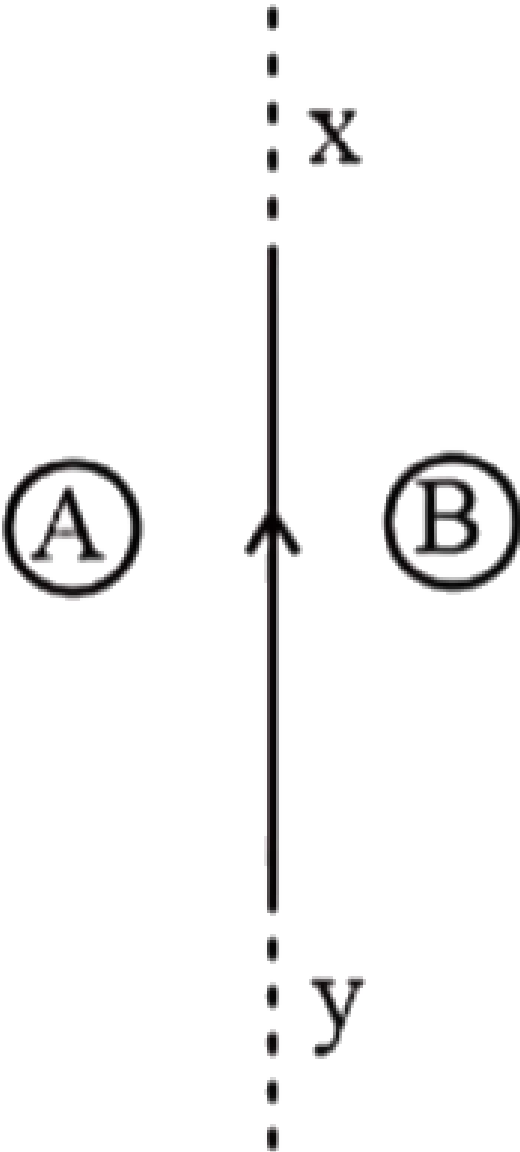


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**20.** Consider the situation shown in figure. If the current  $I$  in the long straight wire  $xy$  is increased at a steady



rate the induced current in loop A and B will be



- A. Clockwise in A and anticlockwise in B
- B. Anticlockwise in A and clockwise in B
- C. Clockwise in both A and B
- D. Anticlockwise in both A and B

**Answer:**



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**21.** A short bar magnetic is placed in a uniform magnetic field of 0.25 T, with its axis at an angle of  $30^\circ$  with the field. If it experiences a torque of magnitude  $4.5 \times 10^{-2}$  N m, then its magnetic momentum is

A.  $0.36 \text{ N m T}^{-1}$

B.  $0.25 \text{ N m T}^{-1}$

C.  $0.5 \text{ N m T}^{-1}$

D.  $1.25 \text{ N m T}^{-1}$

**Answer:**



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**22.** Find the time after which the particle's initial velocity will be perpendicular to instantaneous velocity when it is projected with  $30 \text{ m/s}$  from horizontal ground by making an angle  $60^\circ$  with vertical

A. 6 second

B.  $2\sqrt{3}$ second

C. 3 second

D. Never possible

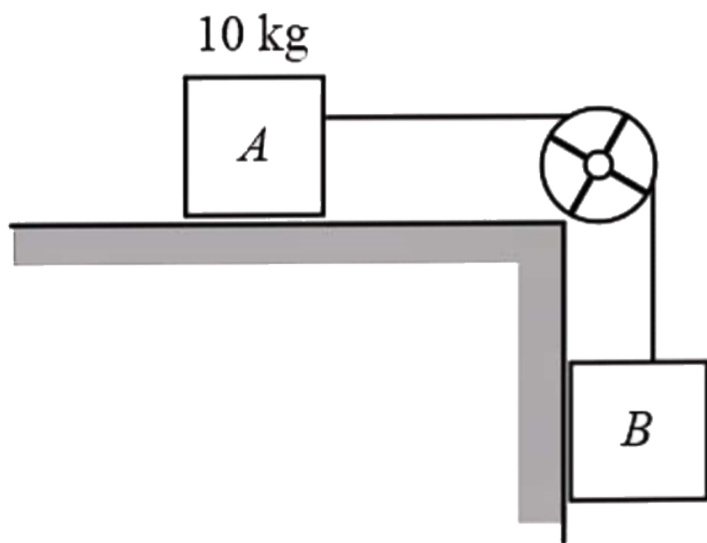
**Answer:**



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**23.** If the mass of A=10 kg, coefficient of static friction=0.22, coefficient of kinetic friction=0.2, then

minimum mass of B to start motion is



A. 2 kg

B. 2.2 kg

C. 4.8 kg

D. 3.4 kg

**Answer:**

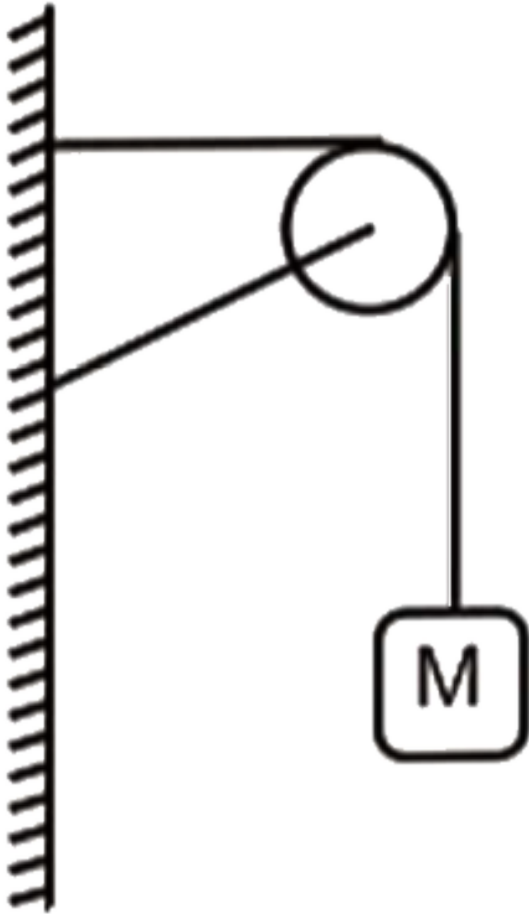


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**24.** A mass string going over a clamped pulley of mass  $m$  supports a block of mass  $M$  as shown in the figure.

The force on the pulley by the clamp is given



A.  $\sqrt{2}Mg$

B.  $\sqrt{2}mg$

C.  $g\sqrt{(M+m)^2 + m^2}$

D.  $g\sqrt{(M+m)^2 + M^2}$

**Answer:**



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**25.** In a radioactive material the activity at time  $t_1$  is  $R_1$  and at a later time  $t_2$ , it is  $R_2$ . If the decay constant of the material is  $\lambda$ , then

A.  $R_1 = R_2$

B.  $R_1 = R_2 e^{-\lambda(t_1 - t_2)}$

C.  $R_1 = R_2 e^{\lambda(t_1 - t_2)}$



D.  $R_1 = R_2(t_2/t_1)$ .

**Answer:**



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26.  ${}_{92}\text{U}^{235}$  undergoes successive disintegrations with the end product of  ${}_{82}\text{Pb}^{203}$ . The number of  $\alpha$  and  $\beta$  particles emitted are

A.  $\alpha = 6, \beta = 4$

B.  $\alpha = 6, \beta = 0$

C.  $\alpha = 8, \beta = 6$

D.  $\alpha = 3, \beta = 3$

**Answer:**



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27. A pendulum is executing simple harmonic motion and its maximum kinetic energy is  $K_1$ . If the length of the pendulum is doubled and it performs simple harmonic motion with the same amplitude as in the first case, its maximum kinetic energy is  $K_2$  Then:

A.  $K_2$

B.  $K_2 = \frac{K_1}{2}$

C.  $K_2 = K_1$

D.  $K_2 = \frac{K_1}{4}$

**Answer:**



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**28.** A radio transmitter operates at a frequency of  $880\text{kHz}$  and a power of  $10\text{kW}$ . The number of photons emitted per second are

A.  $1.72 \times 10^{31}$

B.  $1.327 \times 10^{25}$

C.  $1.327 \times 10^{37}$

D.  $1.327 \times 10^{45}$

**Answer:**

29. Let  $K_1$  be the maximum kinetic energy of photoelectrons emitted by a light of wavelength  $\lambda_1$  and  $K_2$  corresponding to  $\lambda_2$ . If  $\lambda_1 = 2\lambda_2$ , then

A.  $2K_1 = K_2$

B.  $K_1 = 2K_2$

C.  $K_1 < K_2/2$

D.  $K_1 > 2K_2$

**Answer:**

30.  $P$  is the atmospheric pressure and the pressure at the bottom of a tank of water is  $3P$ . If the water is drawn out to lower the level of water by one fifth, then the pressure at the bottom of the tank will be

A.  $2P$

B.  $(13/5)P$

C.  $(8/5)P$

D.  $(4/5)P$

**Answer:**



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31. One end of a horizontal thick copper wire of length  $2L$  and radius  $2R$  is welded to an end of another horizontal thin copper wire of length  $L$  and radius  $R$ . When the arrangement is stretched by applying forces at two ends, the ratio of the elongation in the thin wire to that in the thick wire is

A. 0.5

B. 0.25

C. 4

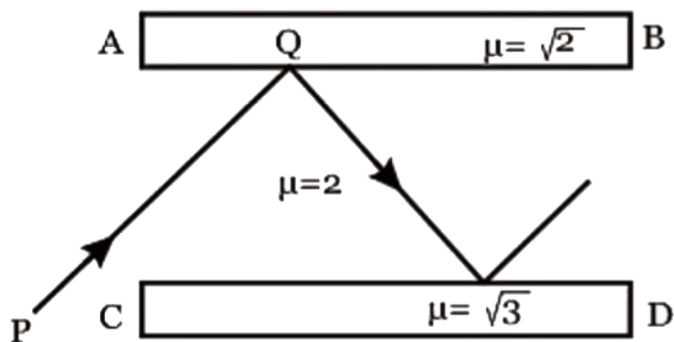
D. 2

**Answer: D**



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32. AB and CD are surfaces of two slabs as shown in Figure . The medium between the slabs has refractive index 2. Refractive index of the slab above AB is  $\sqrt{2}$  and below CD is  $\sqrt{3}$  . Find the minimum angle of incidence at Q, so that the ray is totally reflected by both the slabs.



B. 30

C. 45

D. 15

**Answer:**

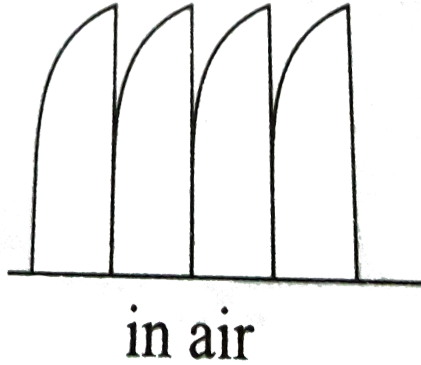
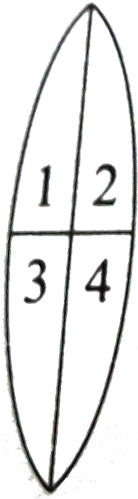


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**33.** The given lens is broken into four parts rearranged as shown. If the initial focal length is  $f$ , then after



rearrangement the equivalent focal length is



A.  $f$

B.  $f/2$

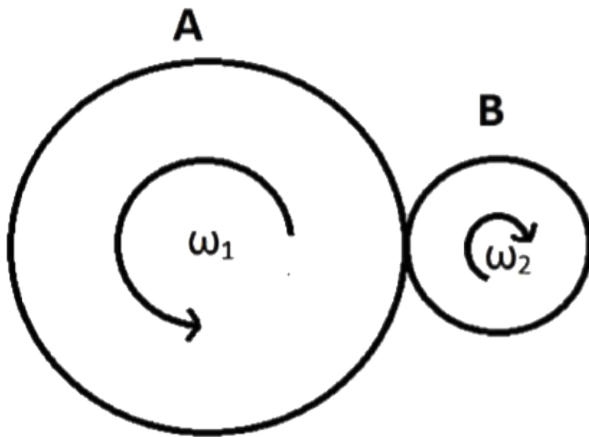
C.  $f/4$

D.  $4f$

**Answer:**



**34.** Two discs A and B are in contact and rotating with angular velocity with angular velocities  $\omega_1$  and  $\omega_2$  respectively as shown. If there is no slipping between the discs, then



A.  $\omega_1 = \omega_2$

B.  $\omega_1 > \omega_2$

C.  $\omega_1 < \omega_2$

D. data insufficient

**Answer:**



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**35.** A ring of radius  $R$  rolls without slipping on a rough horizontal surface with a constant velocity. The radius of curvature of the path followed by any particle of the

ring at the highest point of its path will be :



A.  $5R$

B.  $2R$

C.  $4R$

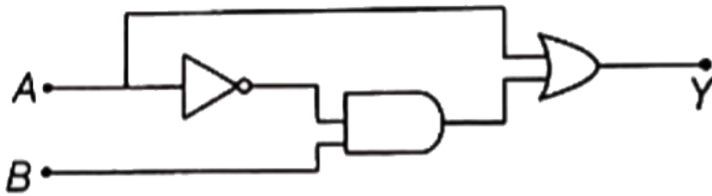
D. none of these

**Answer:**



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36. The circuit is equivalent to



A. AND gate

B. OR gate

C. NOT gate

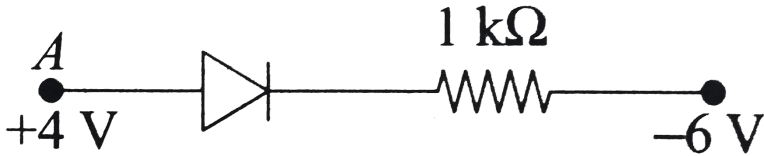
D. NAND gate

**Answer:**



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37. Consider the junction diode as ideal. The value of current flowing through  $AB$  is:



- A.  $0\text{ A}$
- B.  $10^{-2}\text{ A}$
- C.  $10^{-1}\text{ A}$
- D.  $10^{-3}\text{ A}$

**Answer:**



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38. A steel scale is to be prepared such that the millimeter intervals are to be accurate within  $6 \times 10^{-5} \text{ mm}$ . The maximum temperature variation from the temperature of calibration during the reading of the millimeter marks is ( $\alpha = 12 \times 10^{-6} / ^\circ \text{C}$ )

A.  $4.0^\circ \text{C}$

B.  $4.5^\circ \text{C}$

C.  $5.0^\circ \text{C}$

D.  $5.5^\circ \text{C}$ .

**Answer:**



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**39.** When a bimetallic strip is heated, it

A. does not bend at all

B. gets twisted in the form of a helix

C. bends in the form of an arc with the more expandable metal outside

D. bends in the form of an arc with the more expandable metal inside

**Answer:**



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40. The internal and external diameters of a hollow cylinder are measured with the help of a Vernier callipers . Their values are  $4.23 \pm 0.01\text{cm}$  and  $3.87 \pm 0.01\text{cm}$ , respectively . The thickness of the wall of the cylinder is

- A.  $0.35 \pm 0.02\text{m}$
- B.  $0.18 \pm 0.02\text{cm}$
- C.  $0.36 \pm 0.01\text{cm}$
- D.  $0.18 \pm 0.01\text{cm}$

**Answer:**



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41. In a Young's double slit experiment,  $I_0$  is the intensity at the central maximum and  $\beta$  is the fringe width. The intensity at a point P distant  $x$  from the centre will be

A.  $I_0 \cos \frac{\pi x}{\beta}$

B.  $4I_0 \cos^2 \frac{\pi x}{\beta}$

C.  $I_0 \cos^2 \frac{\pi x}{\beta}$

D.  $\frac{I_0}{4} \cos^2 \frac{\pi x}{\beta}$

**Answer:**



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**42.** In Young's double experiment , in air interference pattern second minimum is observed exactly in front of one slit. The distance between the two coherent source is 'd' and the distance between source and screen 'D'. The wavelength of light source used is

A.  $\frac{d^2}{D}$

B.  $\frac{d^2}{2D}$

C.  $\frac{d^2}{3D}$

D.  $\frac{d^2}{4D}$ .

**Answer:**



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43.

$$x_1 = 12 \sin(484\pi t - 7\pi x) \text{ and } x_2 = 12 \sin(480\pi t - 7\pi x)$$

represent the equation of two sound waves and  $x$  and  $t$  are in metre and second. Beat frequency (in Hz) produced by these two waves is

A. 4

B. 3

C. 2

D. 1

**Answer:**



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**44.** If the bulk modulus of water is  $2100 \text{ M Pa}$ , what is the speed of sound in water ?

A.  $1320 \text{ m/s}$

B.  $1450 \text{ m/s}$

C.  $1580 \text{ m/s}$

D.  $1630 \text{ m/s}$

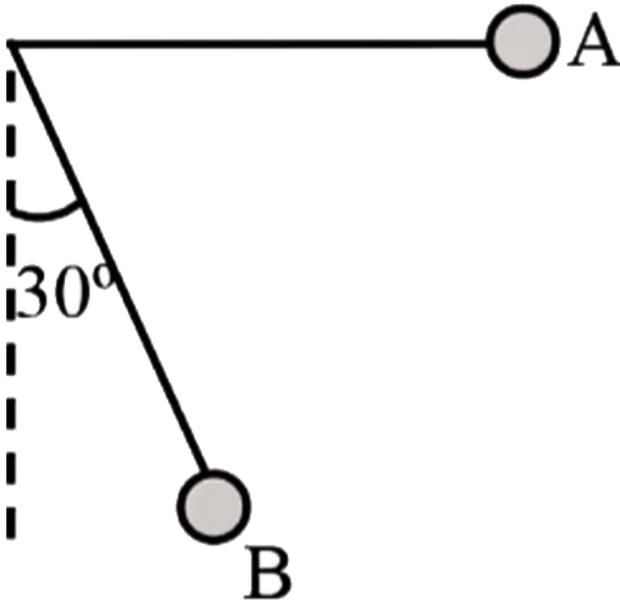
**Answer:**



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**45.** A simple pendulum is released from A as shown. If  $m$  and  $l$  represent the mass of the bob and length of the

pendulum, the gain kinetic energy at B is



- A.  $\frac{mg1}{2}$
- B.  $\frac{mg1}{\sqrt{2}}$
- C.  $\frac{\sqrt{3}}{2}mg1$
- D.  $\frac{2}{\sqrt{3}}mg1$

**Answer:**



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