



# PHYSICS

## BOOKS - NTA MOCK TESTS

### NTA NEET TEST 80

#### Physics

1. The orbital frequency of an electron in the hydrogen atom is proportional to

A.  $n^3$

B.  $n^{-3}$

C.  $n$

D.  $n^0$

**Answer: B**



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2. How many different wavelengths may be observed in the spectrum form a hydrogen

sample, if the atoms are excited to third excited state?

A. 3

B. 4

C. 5

D. 6

**Answer: D**



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3. A rope thrown over a pulley has a ladder with a man of mass  $m$  on one of its ends and a counter balancing mass  $M$  on its other end. The man climbs with a velocity  $v_r$  relative to ladder. Ignoring the masses of the pulley and the rope as well as the friction on the pulley axis, the velocity of the centre of mass of this system is:

A.  $\frac{m}{M} V_r$

B.  $\frac{m}{2M} V_r$

C.  $\frac{M}{m} V_r$

D.  $\frac{2M}{m} V_r$

**Answer: B**



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4. Particle A makes a head on elastic collision with another stationary particle B. They fly apart in opposite directions with equal speeds. The mass ratio will be

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

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

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

D.  $\frac{1}{\sqrt{3}}$

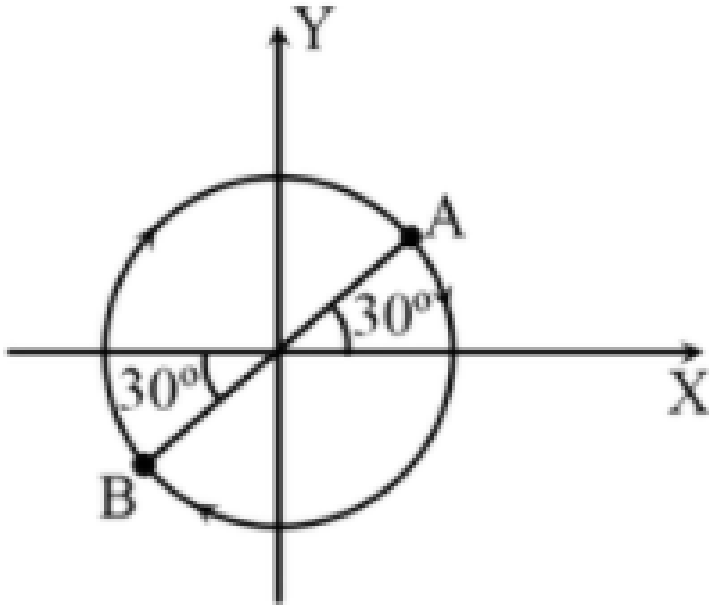
**Answer: A**



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5. A particle moves with a speed  $v$  in a circle of radius  $R$ . when the particle reaches from A to B as shown in the figure, then Y component of

average velocity is



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

B.  $-\frac{v}{\pi}$

C.  $-\frac{2v}{\pi}$

D. zero

**Answer: B**



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6. At time  $t = 0$ , a horizontal disc starts rotating with angular acceleration  $1 \text{ rad/s}^2$  about an axis perpendicular to its plane and passing through its centre. A small block is lying on this disc at a distance  $0.5 \text{ m}$  from the centre. Coefficient of friction between the surface of block and disc is  $0.255$ . The block



will start slipping on the disc at time  $t$ . Which is approximately equal to

A.  $2\sqrt{3}s$

B.  $2\sqrt{2}s$

C.  $6s$

D.  $\sqrt{5}s$

**Answer: D**



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7. In a galvanometer, 5% of the total current in the circuit passes through it. If the resistance of galvanometer is  $G$ , the shunt resistance  $S$  connected to galvanometer is

A.  $19 G$

B.  $\frac{G}{19}$

C.  $20 G$

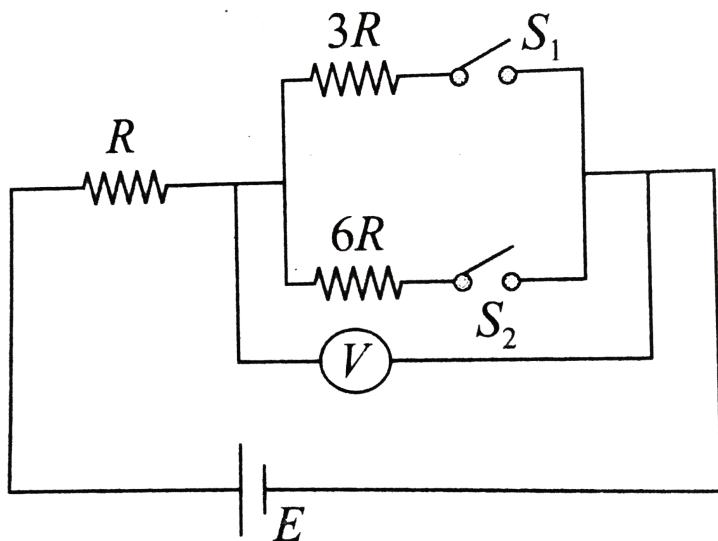
D.  $\frac{G}{20}$

**Answer: B**



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8. In the circuit shown in figure, reading of voltmeter is  $V_1$  when only  $S_1$  is closed, reading of voltmeter is  $V_2$  when only  $S_2$  is closed, and reading of voltmeter is  $V_3$  when both  $S_1$  and  $S_2$  are closed. Then .



A.  $V_3 > V_2 > V_1$

B.  $V_2 > V_1 > V_3$

C.  $V_3 > V_1 > V_2$

D.  $V_1 > V_2 > V_3$

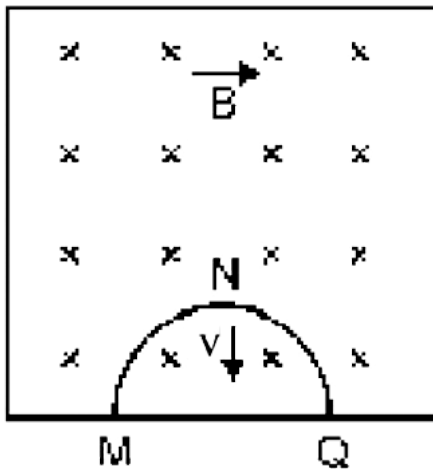
**Answer: B**



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9. A thin semi-circular conducting ring of radius  $R$  is falling with its plane vertical in

horizontal magnetic induction  $(\vec{B})$ . At the position MNQ the speed of the ring is  $v$ , and the potential difference developed across the ring is



A. Zero

B.  $\frac{B\pi R^2}{2}$  and  $M$  is at a higher potential

C.  $\pi BRv$  and  $Q$  is at a higher potential

D. 2RBv and Q is at a higher potential

**Answer: D**



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**10.** 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.  $4.5A$

**Answer: D**



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**11.** A hollow charged metal sphere has radius  $r$ .

If the potential difference between its surface

and a point at a distance  $3r$  from the centre is

$V$ , then electric field intensity at a distance  $3r$  is

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

B.  $\frac{V}{3r}$

C.  $\frac{V}{6r}$

D.  $\frac{V}{4r}$

**Answer: C**

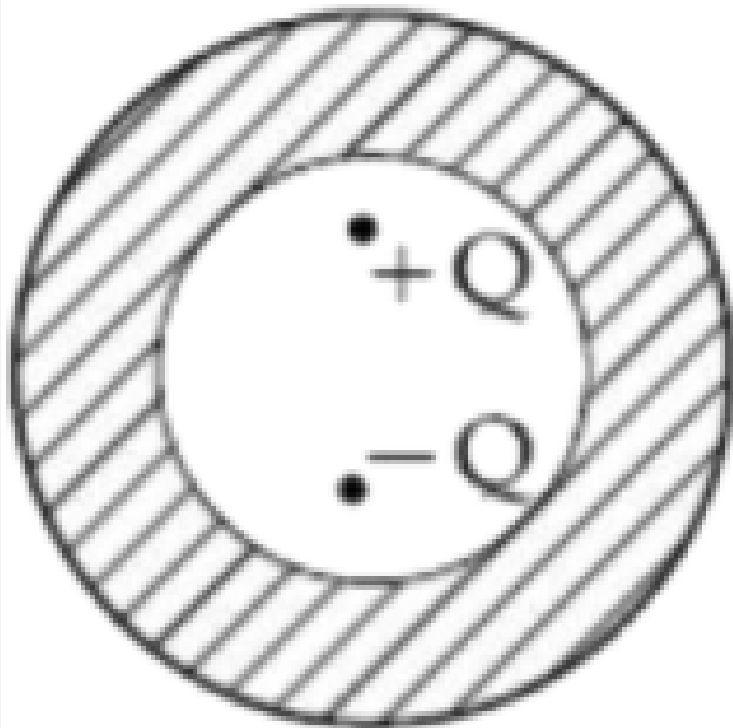


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**12.** Show in the figure are two point charge  $+ Q$  and  $- Q$  inside the cavity of the Spherical shell. the charges are kept near the surface of the cavity on opposite sides of the centre of the shell. if  $\sigma_1$  is the surface charge on the inner surface and  $Q_1$  net charge on it and  $\sigma_2$  the surface charge on the outer surface and  $Q_2$

net charge on it then :



A.  $\sigma_1 = 0, Q_1 = 0, \sigma_2 = 0, Q_2 = 0$

B.  $\sigma_1 \neq 0, Q_1 = 0, \sigma_2 \neq 0, Q_2 = 0$

C.  $\sigma_1 \neq 0, Q_1 \neq 0, \sigma_2 \neq 0, Q_2 \neq 0$

$$D. \sigma_1 \neq 0, Q_1 = 0, \sigma_2 = 0, Q_2 = 0$$

**Answer: D**



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**13.** The gravitational field in a region is given by  $\vec{g} = (5\hat{i} + 12\hat{j}) \text{ N kg}^{-1}$ . The change in the gravitational potential energy of a particle of mass 2kg when it is taken from the origin to a point  $(7m, -3m)$  is

A. 71 J

B.  $13\sqrt{58}J$

C.  $2J$

D.  $1J$

**Answer: C**



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**14.** If earth is supposed to be a sphere of radius  $R$ , if  $g_{30}$  is value of acceleration due to gravity at latitude of  $30^\circ$  and  $g$  at the equator, the value of  $g - g_{30^\circ}$  is

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

B.  $\frac{3}{4}\omega^2 R$

C.  $\omega^2 R$

D.  $\frac{1}{2}\omega^2 R$

**Answer: B**



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**15.** If wavelengths of maximum intensity of radiations emitted by the sun and the moon

are  $0.5 \times 10^{-6}m$  and  $10^{-4}m$  respectively,

the ratio of their temperature is .....

A. 1 : 100

B. 1 : 200

C. 200 : 1

D. 400 : 1

**Answer: C**



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**16.** An inverted bell lying at the bottom of a lake  $47.6m$  deep has  $50cm^3$  of air trapped in it. The bell is brought to the surface of the lake. The volume of the trapped air will be (atmospheric pressure =  $70cm$  of  $Hg$  and density of  $Hg = 13.6g/cm^3$ ).

A.  $600cm^3$

B.  $300cm^3$

C.  $250cm^3$

D.  $200cm^2$

**Answer: B**



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17. 143 calories of heat energy are supplied to a gas . Its internal energy rises by 500 joules . If the pressure remains constant and is equal to  $10^5 Nm^{-2}$  , the change in the volume of the gas is

A. 1000 litres

B. 100 litres



C. 10 litres

D. 1 litre

**Answer: D**



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**18.** A bar magnet has coercivity  $4 \times 10^3 \text{ Am}^{-1}$ .

It is desired to demagnetise it by inserting it inside a solenoid  $12\text{cm}$  long and having 60 turns. The current that should be sent through the solenoid is

A.  $2A$

B.  $4A$

C.  $6A$

D.  $8A$

**Answer: D**



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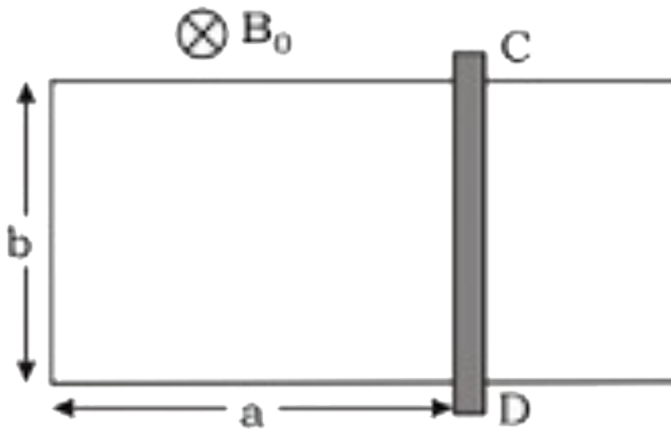
**19.** A U - shaped conducting frame is fixed in space. A conducting rod CD lies at rest on the smooth frame as shown. The frame is in a

uniform magnetic field  $B_0$  which is perpendicular to the plane of the frame. At the time  $t = 0$ , the magnitude of the magnetic field being to change with time  $t$  as,

$$B = \frac{B_0}{1 + kt}, \text{ where } k \text{ is a positive constant.}$$

For no current to be ever induced in the frame the speed with which rod should be pulled starting from time  $t = 0$  is (the rod CD should be moved such that its velocity must lie in the

plane of frame and perpendicular to rod (CD)



A.  $ak$

B.  $bk$

C.  $a(1 + kt)$

D.  $b(1 + kt)$

**Answer: A**



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20. A  $0.5\text{kg}$  block slides from the point A on a horizontal track with an initial speed  $3\text{m/s}$  towards a weightless horizontal spring of length  $1\text{m}$  and force constant  $2\text{N/m}$ . The part AB of the track is frictionless and the part BC has the coefficient of static and kinetic friction as '0.22' and 0.20 respectively. If the distances AB and BD are  $2\text{m}$  and  $2.14\text{m}$  respectively, find total distance through which

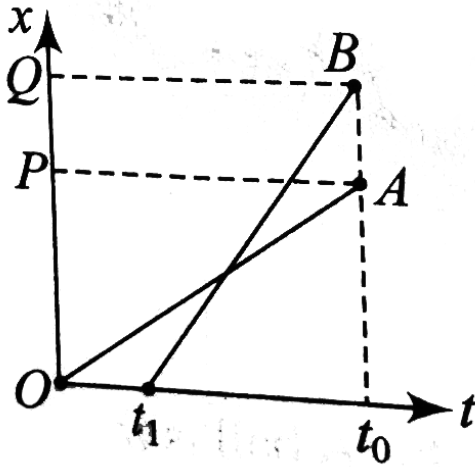
the block moves before it comes to rest completely. ( $g=10 \text{ m/s}^2$ ).

- A. point north - west
- B. point north - east
- C. point south - east
- D. point south - west

**Answer: B**



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21.

The position-time ( $x-t$ ) graphs for two children A and B returning from their school O to their homes P and Q respectively along straight line path (taken as  $x$ -axis) are shown in figure.

Choose the correct statement (s):

A. A lives closer to the school than B

B. A starts from the school earlier than B

C. A and B have equal average velocities

from 0 to  $t_0$

D. B overtakes A on the way

**Answer: C**



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**22.** Two cars move in the same direction along parallel roads. One of them is a  $200m$ , long travelling with a velocity of  $20m/s$ . The



second one is  $800m$  long travelling with a velocity of  $7.5m/s$ . How long will it take for the first car to overtake the second car?

A. 20 s

B. 40 s

C. 60 s

D. 80 s

**Answer: D**



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**23.** A bullet of mass 20 g has an initial speed of  $1\text{ms}^{-1}$  just before it starts penetrating a mud wall of thickness 20 cm. If the wall offers a mean resistance of  $2.5 \times 10^{-2}\text{N}$  the speed of the bullet after emerging from the other side of the wall is close to:

A.  $0.7\text{ms}^{-1}$

B.  $0.3\text{ms}^{-1}$

C.  $0.1\text{ms}^{-1}$

D.  $0.4\text{ms}^{-1}$

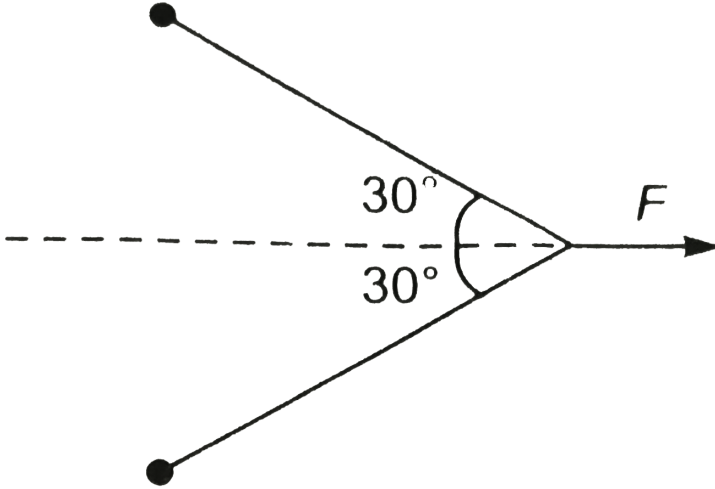
**Answer: A**



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24. In figure two identical particles each of mass  $m$  are tied together with an inextensible string. This is pulled at its centre with a constant force  $F$ . If the whole system lies on a smooth horizontal plane, then the acceleration of each particle towards each

other is



A.  $\frac{\sqrt{3}}{2} \frac{F}{m}$

B.  $\frac{1}{2\sqrt{3}} \frac{F}{m}$

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

D.  $\sqrt{3} \frac{F}{m}$

**Answer: B**



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**25.** Half-lives of two radioactive elements A and B are 20 minutes and 40 minutes, respectively. Initially, the samples have equal number of nuclei. After 80 minutes, the ratio of decayed numbers of A and B nuclei will be -

(A) 1 : 16

(B) 4 : 1

(C) 1 : 4

(D) 5 : 4

A. 1 : 4

B. 5 : 4

C. 1 : 16

D. 4 : 1

**Answer: B**



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**26.** Calculate the energy released when three alpha particles combine to form  ${}^A_{12}\text{C}$  nucleus.

The atomic mass of  ${}^4_2\text{He}$  is  $4.002603u$ .

A.  $0.007809 \text{ u}$

B.  $0.002603 \text{ u}$

C.  $4.002603 \text{ u}$

D.  $0.5 \text{ u}$

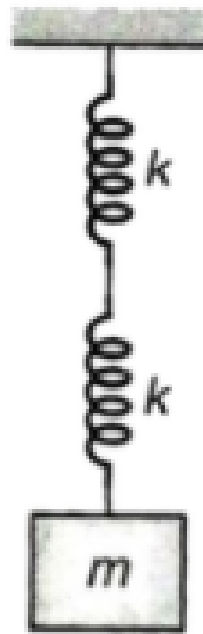
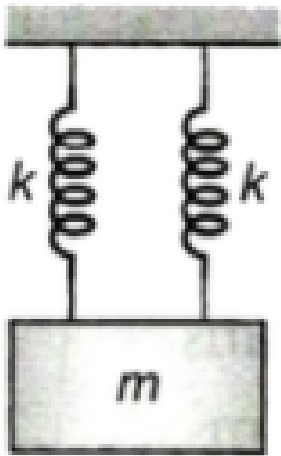
**Answer: A**



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**27.** Two identical springs are connected in series and parallel as shown in the figure . If  $f_s$  and  $f_p$  are frequencies of arrangements,

what is  $\frac{f_s}{f_p}$  ?



A. 1:2

B. 2:1

C. 1:3

D. 3:1



**Answer: A**



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**28.** Two simple pendulum first of bob mass  $M_1$  and length  $L_1$  second of bob mass  $M_2$  and length  $L_2$   $M_1 = M_2$  and  $L_1 = 2L_2$ . if the vibrational energy of both is same which is correct?

A. Amplitude of B is smaller than A

B. Amplitude of B is greater than A

C. Amplitude will be same

D. None of the above

**Answer: A**



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**29.** Electrons with de-Broglie wavelength  $\lambda$  fall on the target in an X-ray tube. The cut-off wavelength of the emitted X-ray is

A.  $\lambda_0 = \frac{2mc\lambda^2}{h}$

B.  $\lambda_0 = \frac{2h}{mc}$

C.  $\lambda_0 = \frac{2m^2c^2\lambda^2}{h^2}$

D.  $\lambda_0 = \lambda$

**Answer: A**



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**30.** The kinetic energy of the most energetic photoelectrons emitted from a metal surface is doubled when the wavelength of the

incident radiation is reduced from  $\lambda_1$  to  $\lambda_2$

The work function of the metal is

A.  $\frac{hc}{\lambda_1 \lambda_2} (2\lambda_2 - \lambda_1)$

B.  $\frac{2hc}{\lambda_1 \lambda_2} (2\lambda_1 - \lambda_2)$

C.  $\frac{2hc}{\lambda_1 \lambda_2} (\lambda_1 + \lambda_2)$

D.  $\frac{2hc}{\lambda_1 \lambda_2} (\lambda_1 - \lambda_2)$

**Answer: A**



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31. 8000 identical water drops are combined to form a big drop then the ratio of the final surface energy to the initial surface energy of all the drops together is

A. 1 : 10

B. 1 : 15

C. 1 : 20

D. 1 : 25

**Answer: C**



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32. Adiabatic modulus of elasticity of a gas is  $2.1 \times 10^5 \text{ N/m}^2$ . What will be isothermal modulus if elasticity  $\left(\frac{C_p}{C_v} = 1.4\right)$

A.  $1.2 \times 10^5 \text{ Nm}^{-2}$

B.  $4 \times 10^5 \text{ Nm}^{-2}$

C.  $1.5 \times 10^5 \text{ Nm}^{-2}$

D.  $1.8 \times 10^5 \text{ Nm}^{-2}$

**Answer: C**



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33. The plane faces of two identical plano-convex lenses, each with focal length  $f$  are pressed against each other using an optical glue to form a usual convex lens. The distance from the optical centre at which an object must be placed to obtain the image same as the size of the object is

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

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

C.  $f$

D.  $2f$

**Answer: C**

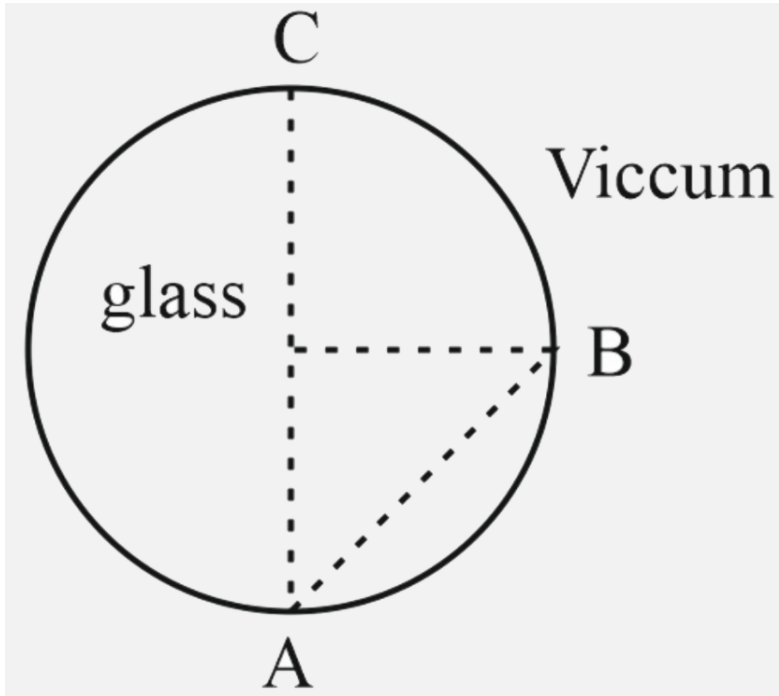


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**34.** It is found that Ball electromagnetic signals sent from A towards B reach point C.  
The speed of electromagnetic signals in glass



cannot be.



A.  $1.0 \times 10^8 \text{ms}^{-1}$

B.  $2.15 \times 10^8 \text{ms}^{-1}$

C.  $2 \times 10^7 \text{ms}^{-1}$

D.  $4 \times 10^7 \text{ms}^{-1}$

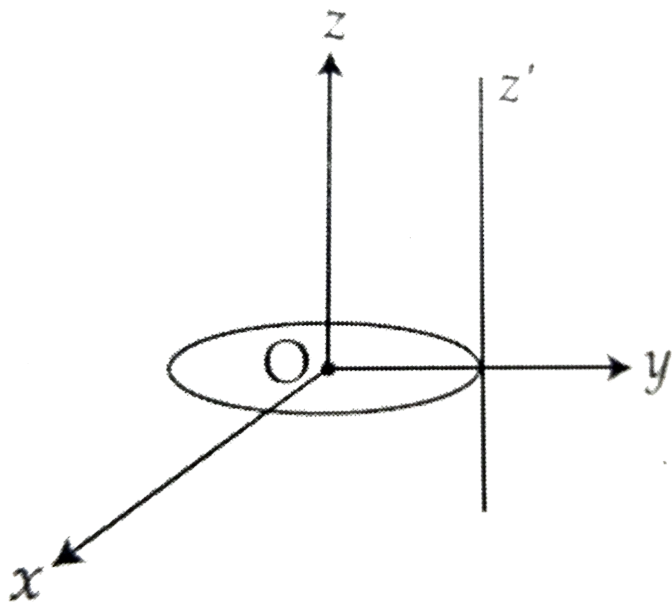
**Answer: B**



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**35.** A thin circular disk is in the  $xy$  plane as shown in the figure. The ratio of its moment of

inertia about  $z$  and  $z'$  axes will be :



A. 1:4

B. 1:5

C. 1:3

D. 1:2

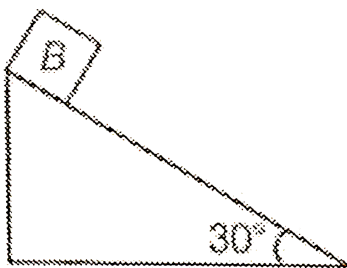
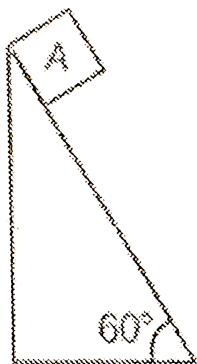
**Answer: C**



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**36.** Two fixed frictionless inclined plane making angles  $30^\circ$  and  $60^\circ$  with the vertical are shown in the figure. Two blocks A and B are placed on the two planes What is the relative

vertical acceleration of A with respect to B ?



A. Zero

B.  $4.9ms^{-2}$  in the vertical direction

C.  $4.9ms^{-2}$  in horizontal direction

D.  $9.8ms^{-2}$  in the vertical direction

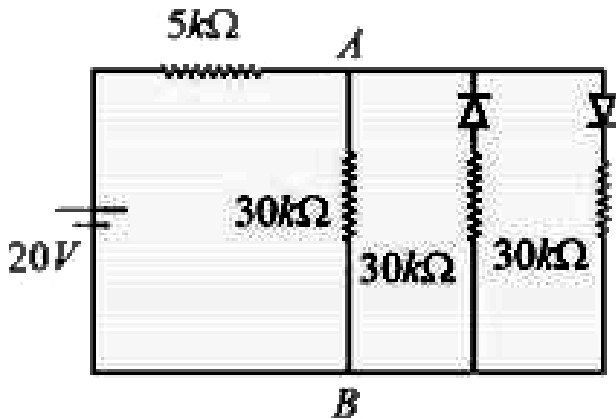
**Answer: B**



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37. In the figure, potential difference between

A & B is



A. 10 V

B. 5 V

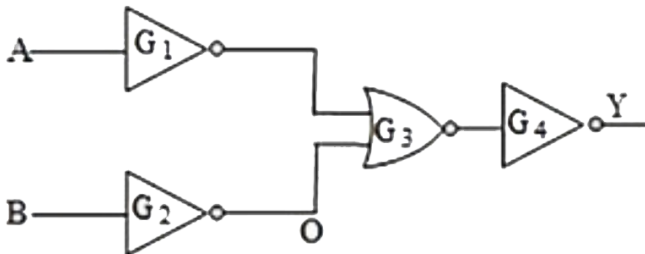
C. 15 V

D. 0 V

Answer: A

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38. The combination of gates shown below produces



A. OR gate

B. NOT gate

C. XOR gate

D. NAND gate

**Answer: A**



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**39.** Coefficient of linear expansion of brass and steel rods are  $\alpha_1$  and  $\alpha_2$ . Length of brass and steel rods are  $l_1$  and  $l_2$  respectively. If  $(l_2 - l_1)$



is maintained same at all temperature, which one of the following relations holds good?

A.  $\alpha_1 l_1 = \alpha_2 l_2$

B.  $\alpha_1 l_2 = \alpha_2 l_1$

C.  $\alpha_1^2 l_2 = \alpha_2^2 l_1$

D.  $\alpha_1 l_2^2 = \alpha_2 l_1^2$

**Answer: A**



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40. The quantities  $A$  and  $B$  are related by the relation,  $m = A/B$ , where  $m$  is the linear density and  $A$  is the force. The dimensions of  $B$  are of

- A. Pressure
- B. Work
- C. Latent heat
- D. None of the above

**Answer: C**



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41. In a given region of 10 fringes are observed in the reflected beam from a thin film. If the wavelength of the incident light is changed from  $4200\text{\AA}$  to  $6000\text{\AA}$ , then the number of fringes observed in the same region will be

A. 4

B. 7

C. 11

D. 3

**Answer: B**



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**42.** Light propagates 2 cm distance in glass of refractive index 1.5 in time  $t_0$ . In the same time  $t_0$ , light propagates a distance of 2.25 cm in medium. The refractive index of the medium is

A.  $\frac{4}{3}$

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

C.  $\frac{8}{3}$

D. None of these

**Answer: A**



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**43.** In the experiment for the determination of the speed of sound in air using the resonance column method, the length of the air column that resonates in the fundamental mode, with a tuning fork is  $0.1m$ . When this length is changed to  $0.35m$ , the same tuning fork

resonates with the first overtone. Calculate the end correction.

A. 0.012 m

B. 0.025 m

C. 0.05 m

D. 0.024 m

**Answer: B**



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**44.** Two sound waves of wavelength  $1m$  and  $1.01m$  in a gas produce 10 beats in 3s. The velocity of sound in the gas is

A.  $150ms^{-1}$

B.  $115.2ms^{-1}$

C.  $336.6ms^{-1}$

D.  $200ms^{-1}$

**Answer: C**



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45. A machine gun fires 240 bullets per minute. If the mass of each bullet is 10 g and the velocity of the bullets is  $600\text{ms}^{-1}$ , then find power (in kW) of the gun.

A. 43200

B. 432

C. 72

D. 7.2

**Answer: D**



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