



# PHYSICS

## BOOKS - NTA MOCK TESTS

### NTA NEET SET 66

#### Physics

1. The ratio of kinetic energy to the total energy of an electron in a Bohr orbit of the hydrogen atom, is

A.  $-2$

B.  $-1$

C.  $2$

D.  $1$

**Answer: B**



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2. A difference of  $2.3 \text{ eV}$  separates two energy levels in an atom. What is the frequency of radiation emitted when the atom makes a transition from the higher energy level to the lower energy level?

transition from the upper level to the lower level ?

A.  $6.7 \times 10^{14} \text{ Hz}$

B.  $4.6 \times 10^{14} \text{ Hz}$

C.  $5.6 \times 10^{14} \text{ Hz}$

D.  $7.7 \times 10^{14} \text{ Hz}$

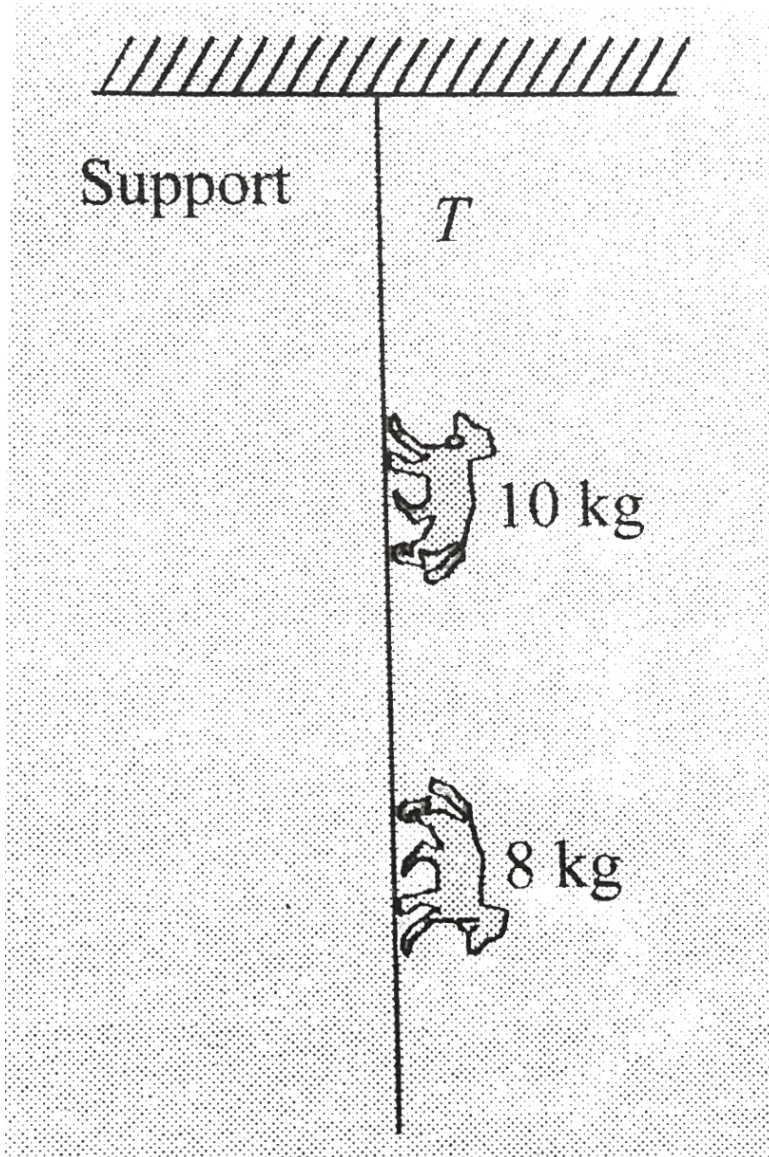
**Answer: C**



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3. Two monkey of masses 10 kg and 8 kg are moving along a verticle rope as shown in fig. the former climbing up with an acceleration of  $2ms^{-2}$ , while the later coming down with a uniform velocity of  $2ms^{-1}$ . Find the tension in

the rope at the fixed support.



A. 200 N

B. 120 N

C. 180 N

D. 160 N

**Answer: A**



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4. The coordinates of the centre of mass of a system of three particles of mass 1g, 2g and 3g are (2, 2, 2). Where should a fourth particle of mass 4 g be positioned so that the centre of

mass of the four particle system is at the origin of the three-dimensional coordinate system ?

A.  $(1, 1, 1)$

B.  $(2, 2, 2)$

C.  $(3, 3, 3)$

D.  $(-3, -3, -3)$

**Answer: D**



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5. A 500 kg car takes a round turn of radius 50 m with a velocity of 36 km/hr . The centripetal force is

A. 250 N

B. 750 N

C. 1000 N

D. 1200 N

**Answer: C**



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6. What would be the maximum speed of a car on a road turn of radius 30 m, if the coefficient of friction between the tires and the road is 0.4 ?

A.  $10.84\text{ms}^{-1}$

B.  $9.84\text{ms}^{-1}$

C.  $8.84\text{ms}^{-1}$

D.  $6.84\text{ms}^{-1}$

**Answer: A**



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7. Mobility of free electrons in a conductor is

A. Directly proportional to electron density

B. Directly proportional to relaxation time

C. Inversely proportional to electron density

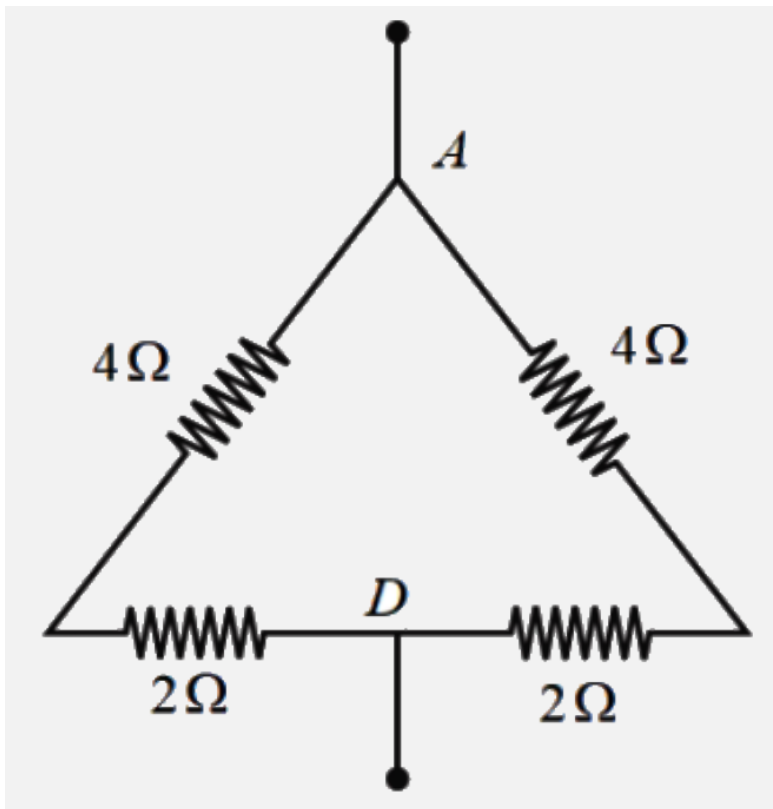
D. Inversely proportional to relaxation time

**Answer: B**



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8. Three resistances of  $4\Omega$  each are connected as shown in the figure. If point D divides the resistance into two equal halves, the resistance between points A and D will be



A.  $12\Omega$

B.  $6\Omega$

C.  $3\Omega$

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

**Answer: C**



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9. A transformer has 100 turns in the primary coil and carries  $8A$  current. If input power is

one kilowatt, the number of turns required in the secondary coil to have  $500V$  output will be

A. 100

B. 200

C. 400

D. 300

**Answer: C**



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10. The inductance of a solenoid of mean diameter 1 cm, 1 m long, wound with 1000 turns of copper wire will be

- A. 0.1 mH
- B. 0.2 mH
- C. 0.3 mH
- D. 0.4 mH

**Answer: A**



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**11.** An electric dipole is fixed at the origin of coordinates. Its moment is directed in the positive  $x$ - direction. A positive charge is moved from the point  $(r, 0)$  to the point  $(-r, 0)$  by an external agent. In this process, the work done by the agent is

- A. positive and inversely proportional to  $r$
- B. positive and inversely proportional to  $r^2$
- C. negative and inversely proportional to  $r$

D. negative and inversely proportional to

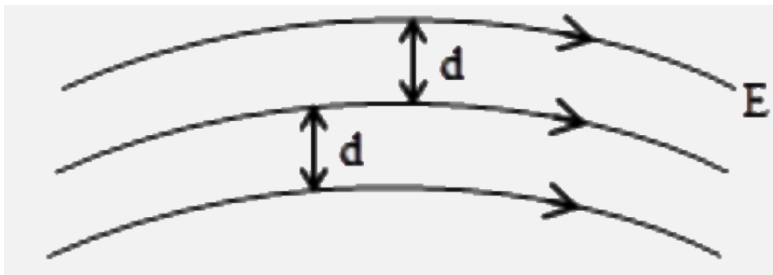
$$r^2$$

**Answer: D**



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**12.** For the following electric field lines, the the electric field is





A. Non uniform

B. Uniform

C. Both uniform & non uniform

D. Can't be said

**Answer: A**



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**13.** Two bodies of masses  $m$  and  $4m$  are placed at a distance  $r$ . The gravitational potential at a

point on the line joining them where the gravitational field is zero is:

A.  $-\frac{6Gm}{r}$

B.  $-\frac{9Gm}{r}$

C. Zero

D.  $-\frac{4Gm}{r}$

**Answer: B**



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14. The semi-major axis of the orbit of Saturn is approximately nine times that of Earth. The time period of revolution of Saturn is approximately equal to

A. 81 years

B. 27 years

C. 729 years

D. 9 years

**Answer: B**



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15. Two identical square rods of metal are welded end to end as shown in figure (i), 20 calories of heat flows through it in 4 minutes. If the rods are welded as shown in figure (ii), the same amount of heat will flow through the rods in



(i)



(ii)

A. 1 min

B. 2 min

C. 4 min

D. 16 min

**Answer: A**



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**16.** For a gas  $\frac{R}{C_V} = 0.4$ , where  $R$  is the universal gas constant and  $C$  is molar specific heat at constant volume. The gas is made up of molecules which are

A. rigid diatomic

B. monoatomic

C. non - rigid diatomic

D. polyatomic

**Answer: A**



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**17.** A monatomic gas expands at constant pressure on heating. The percentage of heat

supplied that increases the internal energy of the gas and that is involved in the expansion is

A. 75 % , 25 %

B. 25 % , 75 %

C. 60 % , 40 %

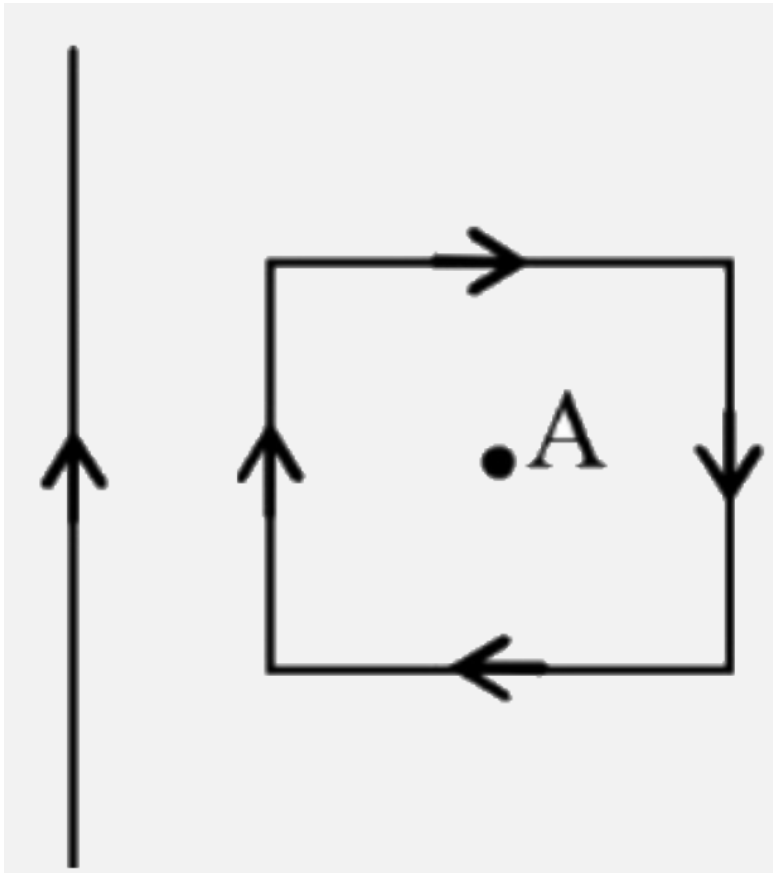
D. 40 % , 60 %

**Answer: C**



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**18.** A wire is parallel to a square coil . The coil and wire carry currents in the directions shown . Then, at any point A within the coil the magnetic field will be -





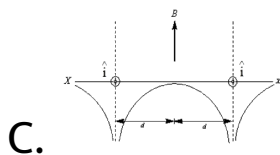
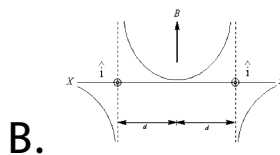
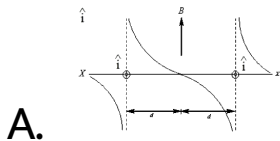
- A. less than the magnetic field produced  
due to coil only
- B. more than the magnetic field produced  
due to coil only
- C. equal to the field by coil alone
- D. zero

**Answer: B**

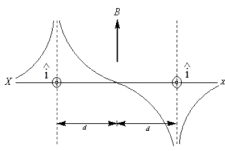


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19. Two long parallel wires are at a distance  $2d$  apart. They carry steady equal currents flowing out of the plane of the paper, as shown. The variation of the magnetic field  $B$  along the line  $XX$  is given by



D.



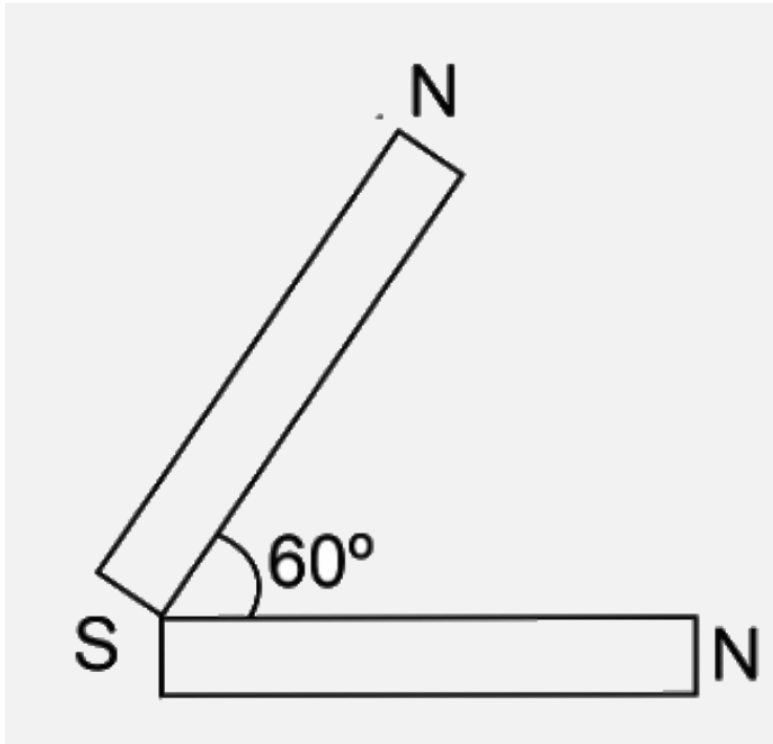
**Answer: A**



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**20.** The net magnetic moment of the identical magnets each of magnetic moment  $M_0$

inclined at  $60^\circ$  with each other is



A.  $M_0$

B.  $\sqrt{2}M_0$

C.  $\sqrt{3}M_0$

D.  $2M_0$

**Answer: C**



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21. A blind person after walking 10 steps in one direction, each of length 80 cm, turns randomly to the left or to right by  $90^\circ$ . After walking a total of 40 steps, the maximum displacement of the person from its starting point can be :

A. zero

B.  $8\sqrt{2}m$

C.  $16\sqrt{2}m$

D. 32 m

**Answer: C**



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22. A particle is projected from the ground with an initial speed of  $v$  at an angle  $\theta$  with horizontal. The average velocity of the particle between its point of projection and highest point of trajectory is :

A.  $\frac{v}{2} \sqrt{1 + 2 \cos^2 \theta}$

B.  $\frac{v}{2} \sqrt{1 + \cos^2 \theta}$

C.  $\frac{v}{2} \sqrt{1 + 3 \cos^2 \theta}$

D.  $v \cos \theta$

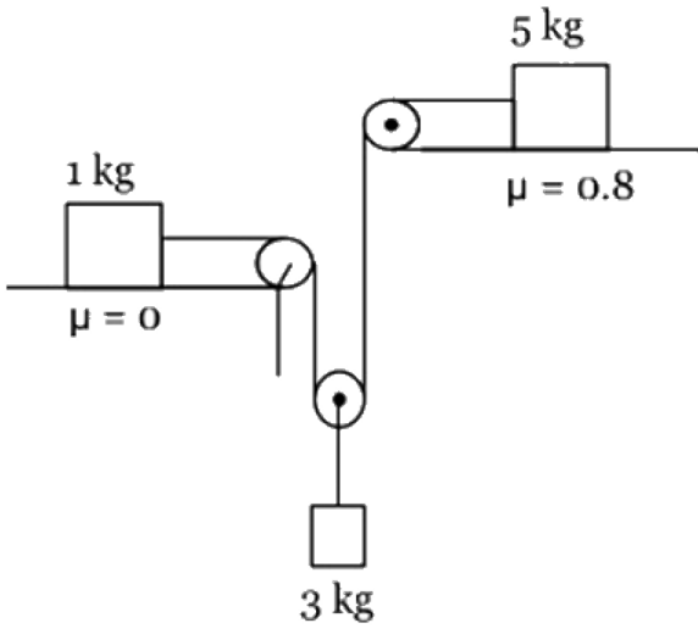
**Answer: C**



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**23.** The acceleration of 3 kg block in the arrangement shown in the diagram ,when the

given system is released from rest is



A.  $4.3 \text{ m s}^{-2}$

B.  $37. \text{ m s}^{-2}$

C.  $6 \text{ m s}^{-2}$

D.  $4 \text{ m s}^{-2}$



**Answer: A**



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**24.** Consider a car moving on a straight road with a speed of  $100\text{m/s}$ . The distance at which car can be stopped is  $[\mu_k = 0.5]$

- A. 400 m
- B. 100 m
- C. 1000 m
- D. 800 m

**Answer: C**



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**25.** If 10 % of a radioactive substance decays in every 5 year, then the percentage of the substance that will have decaed in *20years* will be .

A. 40 %

B. 50 %

C. 65.6 %

D. 34.4 %

**Answer: D**



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**26.** The half-life period of a radio-active element  $X$  is same as the mean life time of another radio-active element  $Y$ . Initially they have the same number of atoms. Then:

A.  $X$  and  $Y$  decay at same rate always

B. X will decay faster than Y

C. Y will decay faster than X

D. X and Y have same decay rate initially

**Answer: B**



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27. A particle of mass 1 kg is moving in SHM with path length 0.01 m and a frequency of 50 Hz. The maximum force in newton, acting on the particle is

A.  $150\pi^2$

B.  $200\pi^2$

C.  $100\pi^2$

D.  $50\pi^2$

**Answer: C**



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**28.** A particle of mass  $m$  is moving along the  $x$ -

axis under the potential  $V(x) = \frac{kx^2}{2} + \lambda$

Where  $k$  and  $x$  are positive constants of appropriate dimensions . The particle is slightly displaced from its equilibrium position . The particle oscillates with the the angular frequency ( $\omega$ ) given by

A.  $3\frac{k}{m}$

B.  $2\frac{m}{k}$

C.  $\sqrt{\frac{k}{m}}$

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

**Answer: C**



**29.** When ultraviolet radiation is incident on a surface , no photoelectrons are emitted If a second beam causes photoelectrons to be ejected, it may consist of

- A. Infrared waves
- B. X - rays
- C. Visible light rays
- D. Radio waves

**Answer: B**



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**30.** A plane  $E. M.$  wave of frequency  $40MHz$  travels along  $X$ -axis. At same point at same instant, the electric field  $E$  has maximum value of  $750N/C$  in  $Y$ - direction. The magnitude and direction of magnetic field is

A.  $2.5\mu T$  in  $x$  - direction

B.  $2.5\mu T$  in  $y$  - direction



C.  $2.5\mu T$  in z - direction

D. None

**Answer: C**



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**31.** A cuboidal piece of wood has dimensions  $a$ ,  $b$  and  $c$ . its relatively density is  $d$ . it is floating in a large body of water such that side  $a$  is vertical. It is pushed down a bit and released. The time period of SHM executed by it is

A.  $2\pi \sqrt{\frac{abc}{g}}$

B.  $2\pi \sqrt{\frac{g}{da}}$

C.  $2\pi \sqrt{\frac{bc}{dg}}$

D.  $2\pi \sqrt{\frac{da}{g}}$

**Answer: D**



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**32.** Young's modulus of elasticity is the ratio of

A. Hydraulic stress and hydraulic strain

B. Shearing stress and shearing strain

C. Tensile stress and longitudinal strain

D. Bulk stress and longitudinal strain

**Answer: C**



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**33.** For an eye kept at a depth  $h$  inside water is refractive index  $\mu$ , and viewed outside, the radius of circle through which the outer objects can be seen will be

A.  $\frac{h}{\sqrt{\mu^2 + 1}}$

B.  $\frac{h}{\sqrt{\mu^2 - 1}}$

C.  $\frac{2h}{\sqrt{\mu^2 - 1}}$

D.  $\frac{h}{\sqrt{2\mu^2 - 1}}$

**Answer: C**



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**34.** The magnification of an image by a convex lens is positive only when the object is placed

A. At its focus F

B. Between F and 2F

C. At 2F

D. Between F and optical centre

**Answer: D**



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**35.** Moment of inertia of a uniform circular disc about a diameter is  $I$ . Its moment of inertia about an axis perpendicular to its

plane and passing through a point on its rim  
will be.

A. 6l

B. 4l

C. 2l

D. 8l

**Answer: A**



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**36.** The moment of inertia of a ring about an axis passing through the centre and perpendicular to its plane is  $I$ . It is rotating with angular velocity  $\omega$ . Another identical ring is gently placed on it, so that their centres coincide. If both the rings are rotating about the same axis, then loss in kinetic energy is

A.  $\frac{I\omega^2}{2}$

B.  $\frac{I\omega^2}{4}$

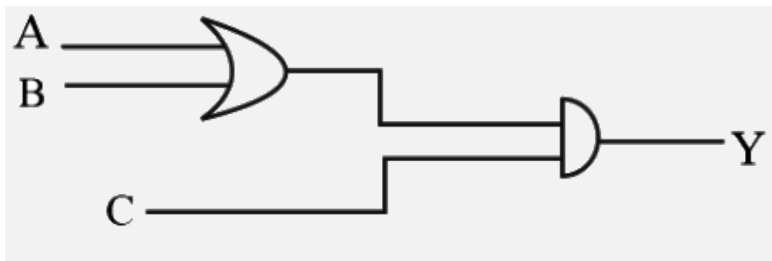
C.  $\frac{I\omega^2}{6}$

D.  $\frac{I\omega^2}{8}$

**Answer: B**

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37. To get an output  $y = 1$  in the given circuit ,  
which of the following input is correct ?



A. 

	<i>A</i>	<i>B</i>	<i>C</i>
	1	0	0



B. 
$$\begin{array}{ccc} A & B & C \\ 1 & 0 & 1 \end{array}$$

C. 
$$\begin{array}{ccc} A & B & C \\ 1 & 1 & 0 \end{array}$$

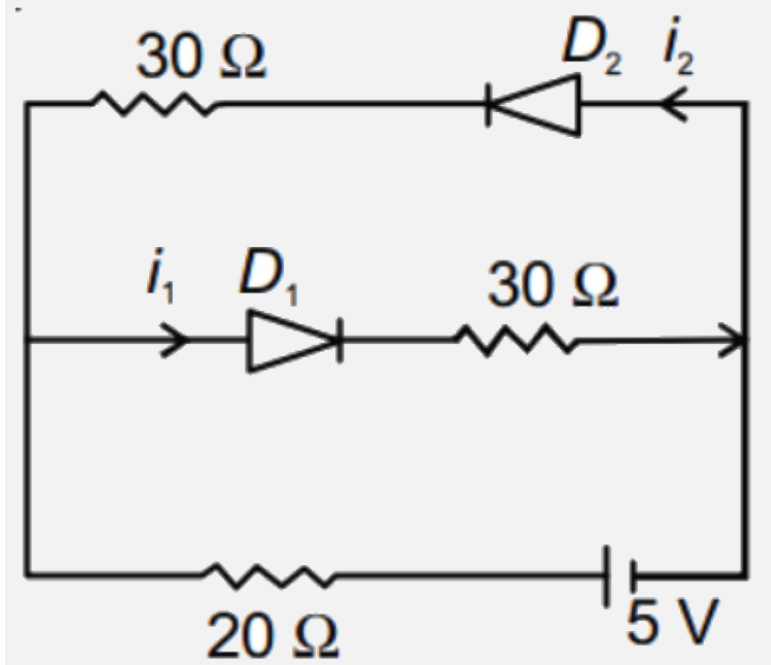
D. 
$$\begin{array}{ccc} A & B & C \\ 0 & 1 & 0 \end{array}$$

**Answer: B**



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**38.** The currents through diodes  $D_1$  and  $D_2$  are



A.  $i_1 = 0.1A, i_2 = 0.1A$

B.  $i_1 = 0.1A, i_2 = 0$

C.  $i_1 = 0, i_2 = 0.3A$

D.  $i_1 = 0, i_2 = 0$

**Answer: B**



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**39.** The apparent coefficient of expansion of a liquid when heated, filled in vessel A and B of identical volumes, is found to be  $\gamma_1$  and  $\gamma_2$ , respectively. If  $\alpha_1$  be the linear expansivity of A then that of B will be

A.  $\frac{(\gamma_1 - \gamma_2)}{3} - \alpha_1$

B.  $\frac{(\gamma_2 - \gamma_1)}{3} + \alpha_1$

C.  $\frac{(\gamma_2 - \gamma_1)}{3} - \alpha_1$

D.  $\frac{(\gamma_1 - \gamma_2)}{3} + \alpha_1$

**Answer: B**



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**40.** In the expression  $P = EI^2m^{-5}G^{-2}$ , E, m, I and G denote energy, mass, angular momentum and gravitational constant, respectively. Show that P is a dimensionless quantity.

A.  $[MLT^{-2}]$

B.  $[M^0 L^0 T]$

C.  $[M^0 L^2 T^0]$

D. Dimensionless

**Answer: D**



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**41. (a)** Why are coherent sources necessary to produce a sustained interference pattern ?

(b) In Young's double slit experiment using monochromatic light of wavelength  $\lambda$ , the

intensity of light at a point on the screen where path difference is  $\lambda$ , is  $K$  units. Find out the intensity of light at a point where path difference is  $\lambda/3$ .

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

B.  $2K$

C.  $4K$

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

**Answer: D**



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**42.** From Brewster's law, except for polished metallic surfaces, the polarising angle

A. depends on wave length and is different for different colours .

B. independent of wavelength and is different for different colours

C. independent of wavelength and is same for different colours

D. depends on wavelength and is same for  
different colours

**Answer: A**



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**43.** A pipe 1 m length is closed at one end.  
Taking the speed of sound in air as  $320\text{ms}^{-1}$   
.the air column in the pipe cannot resonate for  
the frequency (in Hz )



A. 80

B. 160

C. 240

D. 560

**Answer: B**



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**44.** The phase difference between two points separated by 0.8 m in a wave of frequency 120 Hz is  $0.5\pi$ . The wave velocity is

A.  $144ms^{-1}$

B.  $384ms^{-1}$

C.  $256ms^{-1}$

D.  $720ms^{-1}$

**Answer: B**



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**45.** A force  $F$  acting on a body depends on its displacement  $S$  as  $F \propto S^{-1/3}$ . The power delivered by  $F$  will depend on displacement as

A.  $s^{2/3}$

B.  $s^{-5/3}$

C.  $s^{1/2}$

D.  $s^0$

**Answer: D**



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