



# PHYSICS

## NTA MOCK TESTS ENGLISH

### NTA NEET SET 71

#### Physics

1. According to the Bohr model , what determines the shortest wavelength in a given series of wavelength emitted by the atom ?

A. The quantum number  $n_i$  that identifies the higher energy level from which the electron falls into a lower energy level.

B. The quantum number  $n_f$  that identifies the lower energy level into which the electron falls from a higher energy level.

C. The ratio  $n_f / n_i$  where  $n_f$  is the quantum number that identifies the lower energy level into which the electron falls and  $n_i$  is the quantum number that identifies the higher level from which the electron falls .

D. The sum  $n_f + n_f$  of two quantum numbers, where  $n_f$  identifies the lower energy  $n_i$  identifies the higher level from which the electron falls .

**Answer: B**



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2. The frequencies of X-rays,  $\gamma$ -rays and U.V. Rays are respectively a, b and c. Then

A.  $a < d, b > c$

B.  $a < b, b < c$

C.  $a > b > c$

D.  $a > b, b > c$

**Answer: A**



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3. The position Vectors of two identical particles with respect to the origin in the three-dimensional coordinator system are  $r_1$  and  $r_2$  The position of the centre of mass of the system is given by

A. (a)  $r_1 + r_2$

B. (b)  $2(r_1 + r_2)$

C. (c)  $r_1 - r_2$

D. (d)  $\frac{r_1 + r_2}{2}$

**Answer: D**



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4. two heading coils of resistances  $10\Omega$  and  $20\Omega$  are connected in parallel and connected to a battery of emf 12 V and internal resistance  $1\Omega$

Thele power consumed by the n are in the ratio

A. (a) 1 : 4

B. (b) 1 : 3

C. (c) 2 : 1

D. (d) 4 : 1

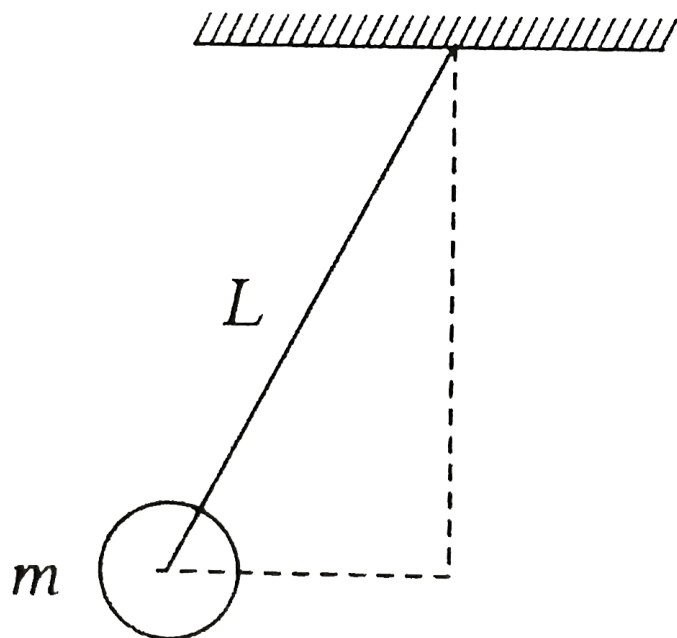
**Answer: C**



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5. A ball of mass ( $m$ ) 0.5 kg is attached to the end of a string having length ( $L$ ) 0.5m. The ball is rotated on a horizontal circular path about vertical axis. The maximum tension that the string can bear

is 324 N. Find the maximum possible value of angular velocity of ball (in  $\text{rads}^{-1}$ ).



- A. 9
- B. 18
- C. 27
- D. 36

**Answer: D**



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6. A body of mass 1 kg is moving in a vertical circular path of radius 1 m. The difference between the kinetic energies at its highest and lowest positions is

A. 10 J

B. 20 J

C. 30 J

D. 50 J

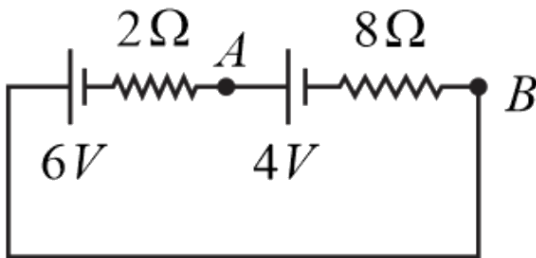


Answer: B



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7. Two potential difference between A and B in the following circuit is



A. 4 V

B. 5.6 V

C. 2.8 V

D. 6 V

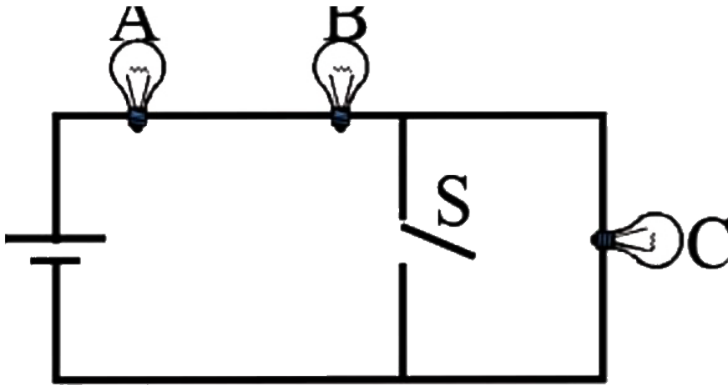
**Answer: A**



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**8.** A circuit consists of three identical lamps connected to a battery as shown in the figure. When the switch S is closed then the intensities of

lamps A and B



- A. will increase by eight times
- B. will decrease by two times
- C. will increase by more than two times
- D. will remain the same

**Answer: C**



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9. A current of 5 A is flowing at 220 V in the primary coil of a transformer . If the voltage produced in the secondary coil 200 V and 50 % of power is lost , then the current in secondary will be :

A. 0.25 A

B. 2.5 A

C. 0.5 A

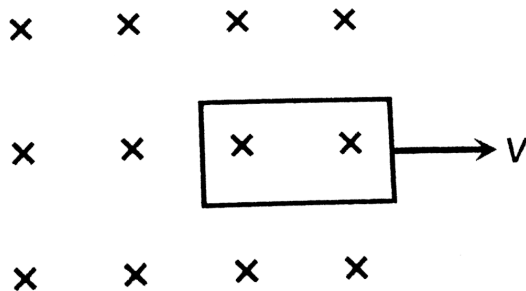
D. 5A

**Answer: A**



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10. Figure show a square loop of side  $0.5m$  and resistance  $10\Omega$ . The magnetic field has a magnitude  $B = 1.0T$ . The work done in pulling the loop out of the field slowly and uniformly in  $2.0s$  is



A. (a)  $3.125 \times 10^{-3} J$

B. (b)  $6.25 \times 10^{-4} J$

C. (c)  $1.25 \times 10^{-2} J$

D. (d)  $5.0 \times 10^{-4} J$

**Answer: A**



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**11.** Two positive ions, each carrying a charge  $q$ , are separated by a distance  $d$ . If  $F$  is the force of repulsion between the ions, the number of electrons missing from each ion will be ( $e$  being the charge on an electron)

A.  $\frac{4\pi\epsilon_0 F d^2}{e^2}$

B.  $\sqrt{\frac{4\pi\epsilon_0 F e^2}{d^2}}$

C.  $\sqrt{\frac{4\pi\epsilon_0 F d^2}{e^2}}$

D.  $\frac{4\pi\epsilon_0 F d^2}{q^2}$

**Answer: C**



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**12.** A hollow insulated conducting sphere is given a positive charge of  $10\mu C$ . What will be the electric field at the centre of the sphere if its radius is 2m?

A. Zero

B.  $5\mu C m^{-2}$

C.  $20\mu C m^{-2}$

D.  $8\mu C m^{-2}$

**Answer: A**



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**13.** A particle is kept at rest at a distance  $R$  (earth's radius) above the earth's surface. The minimum speed with which it should be projected so that it does not return is



A.  $\sqrt{\frac{GM}{4R}}$

B.  $\sqrt{\frac{GM}{2R}}$

C.  $\sqrt{\frac{GM}{R}}$

D.  $\sqrt{\frac{2GM}{R}}$

**Answer: C**



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**14.** A car accelerates from rest at a constant rate  $\alpha$  for some time, after which it decelerates at a constant rate  $\beta$ , to come to rest. If the total time

elapsed is  $t$  seconds. Then evaluate the maximum velocity acquired by the car is

A.  $\left( \frac{\alpha^2 - \beta^2}{\alpha\beta} \right) t$

B.  $\left( \frac{\alpha^2 + \beta^2}{\alpha\beta} \right) t$

C.  $\frac{(\alpha + \beta)t}{\alpha\beta}$

D.  $\frac{\alpha\beta t}{\alpha + \beta}$

**Answer: D**



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**15.** How is the temperature of stars determined by

- A. Planck's law
- B. Wien's displacement law
- C. Rayleigh - jeans law
- D. Kirchhoff's law

**Answer: B**



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**16.** Two moles of a certain gas at a temperature  $T_0 = 300K$  were cooled isochorically so that the pressure of the gas got reduced 2 times. Then as a result of isobaric process, the gas is allowed to

expand till its temperature got back to the initial value. Find the total amount of heat absorbed by gas in this process.

A. 150 R

B. 300 R

C. 75 R

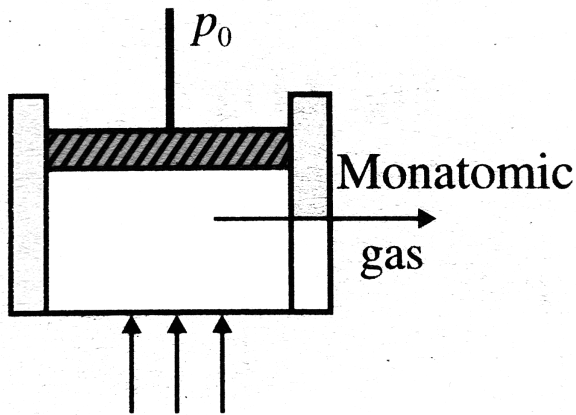
D. 100 R

**Answer: B**



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17. If  $50\text{cal}$  of heat is supplied to the system containing  $2\text{mol}$  of an ideal monatomic gas, the rise in temperature is ( $R = 2\text{cal/mol} - \text{K}$ )



A. (a)  $50\text{ K}$

B. (b)  $5\text{ K}$

C. (c)  $10\text{ K}$

D. (d)  $20\text{ K}$

**Answer: B**



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**18.** A bar magnet is cut into two equal halves by a plane parallel to the magnetic axis of the following physical quantities the one which remains unchanged is

- A. Pole strengths
- B. Magnetic moment
- C. Intensity of magnetization
- D. Moment of inertia

**Answer: C**



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**19.** A wire of arbitrary shape carries a current  $I = 2 \text{ A}$ .

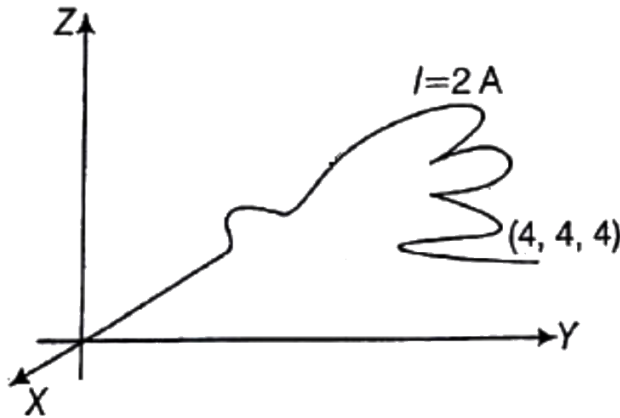
Consider the portion of wire between  $(0,0,0)$  and

$(4,4,4)$  . A magnetic field given by

$\vec{B} = (12 \times 10^{-4} \hat{i} + 2 \times 10^{-4} \hat{j}) \text{ T}$  exists in and

region . The force acting on the given portion the

wire is



A.  $\vec{F} = \left[ (\hat{i} + \hat{j} + \hat{k}) \times (12\hat{i} + 12\hat{j}) \right] N$

B.

$$\vec{F} = 8 \times 10^{-4} \left[ (\hat{i} + \hat{j} + \hat{k}) \times (12\hat{i} + 12\hat{j}) \right] N$$

C. Zero

D. None of the above

**Answer: B**





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**20.** The ratio of the magnetic fields due to small bar magnet in end position an broad side on position is (at equal distance from the magnet)

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

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

C. 1

D. 2

**Answer: D**



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**21.** A stone is released from an aeroplane which is rising with upward acceleration  $5ms^{-2}$ . Here  $g = 10ms^{-1}$ . The two seconds after the release, the separation between stone and aeroplane will be

A. (a) 10 m

B. (b) 20 m

C. (c) 30 m

D. (d) 25 m

**Answer: C**



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**22.** An artillery piece which consistently shoots its shells with the same muzzle speed has a maximum range  $R$ . To hit a target which is  $\frac{R}{2}$  from the gun and on the same level, the angle of elevation of the gun should be

A.  $15^\circ$

B.  $45^\circ$

C.  $30^\circ$

D.  $60^\circ$

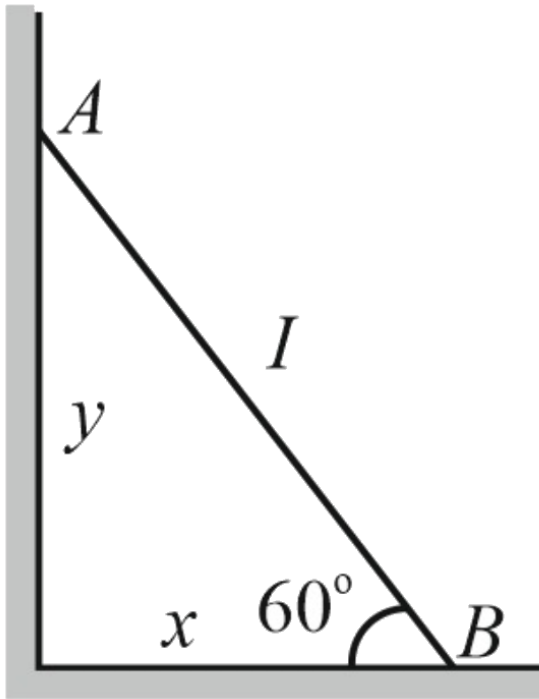
**Answer: A**



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**23.** A rod length AB is moving with ends remaining in contact with frictionless wall and floor . If at the instant shown , the velocity of the and B is  $3ms^{-1}$  towards the negative x-direction , then the

magnitude of the velocity of the end A will be



A. (a)  $3ms^{-1}$

B. (b)  $\sqrt{3}ms^{-1}$

C. (c)  $1.5ms^{-1}$

D. (d)  $2ms^{-1}$

**Answer: B**



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**24.** A block of mass  $kg$  lies on a horizontal surface in a truck. The coefficient of static friction between the block and the surface is  $0.6$ . If the acceleration of the truck is  $5ms^{-2}$ . The frictional force acting on the block is

A.  $5\text{ N}$

B.  $2.5\text{ N}$

C.  $5.88\text{ N}$

D. 9.8 N

**Answer: A**



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**25.** An alpha particle of energy 5 MeV is scattered through  $180^\circ$  by a fixed uranium nucleus. The distance of closest approach is of the order of

A.  $5.3 \times 10^{-12}$

B.  $5.3 \times 10^{-13}$

C.  $5.3 \times 10^{-14}$

D.  $5.3 \times 10^{-15}$

**Answer: C**



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**26.** The half-life of a radioactive sample is  $T$ . If the activities of the sample at time  $t_1$  and  $t_2$  ( $t_1 < t_2$ ) are  $R_1$  and  $R_2$  respectively, then the number of atoms disintegrated in time  $t_2 - t_1$  is proportional to

A.  $(R_1 - R_2)T$

B.  $(R_1 + R_2)T$



C.  $\frac{R_1 R_2}{R_1 + R_2} T$

D.  $\frac{R_1 + R_2}{T}$

**Answer: A**



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**27.** The length of a magnet is large compared to its width and breadth. The period of its oscillation in a vibration magnetometer is 2s. The magnet is cut along its length into three equal parts and three parts are then placed on each other with their like

poles together. The time period of this combination will be

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

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

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

D.  $\sqrt{\frac{3}{2}}s$

**Answer: A**



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**28.** In a simple pendulum, the breaking strength of the string is double the weight of the bob. The bob is released from rest when the string is horizontal. The string breaks when it makes an angle  $\theta$  with the vertical.

A.  $\theta = \sin^{-1}\left(\frac{1}{3}\right)$

B.  $\theta = 60^\circ$

C.  $\theta = \cos^{-1}\left(\frac{2}{3}\right)$

D.  $\theta = 0^\circ$

**Answer: C**



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**29.** A metal surface ejects electrons when hit by green light but none when hit by yellow light. The electrons will be ejected when the surface is hit by

- A. Yellow light of same intensity which is more than I
- B. Green light of any intensity
- C. Red light of any intensity
- D. None of the above

**Answer: B**

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30. Light of energy  $2.0 \text{ eV}$  falls on a metal of work function  $1.4 \text{ eV}$ . The stopping potential is

A. (a)  $0.6 \text{ V}$

B. (b)  $2.0 \text{ V}$

C. (c)  $3.4 \text{ V}$

D. (d)  $1.4 \text{ V}$

**Answer: A**

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**31.** Hydraulic lift' works on the basis of

- A. Stoke's law
- B. Bernoulli's law
- C. Pascal's law
- D. Toricelli's law

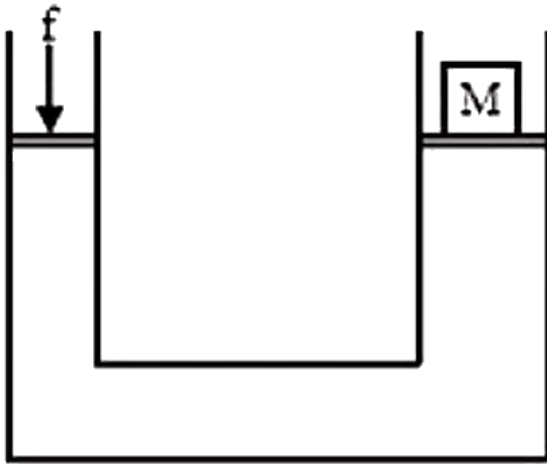
**Answer: C**



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**32.** In a hydraulic press, radii of connecting pipes,  $r_1$  and  $r_2$  are in the ratio 1:2 . In order to lift a

heavy mass  $M$  on the larger piston, the small piston must be pressed through a minimum force  $f$  equal to



A.  $Mg$

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

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

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

**Answer: C**



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**33.** An object is placed at a distance of 20 cm from the pole of concave mirror of focal length 10 cm . The distance of the image formed is

A.  $+20cm$

B.  $+10Cm$

C.  $-20cm$

D.  $-10cm$



**Answer: C**



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**34.** Time taken by the sunlight to pass through a slab of 4 cm and refractive index 1.5 is..... S.

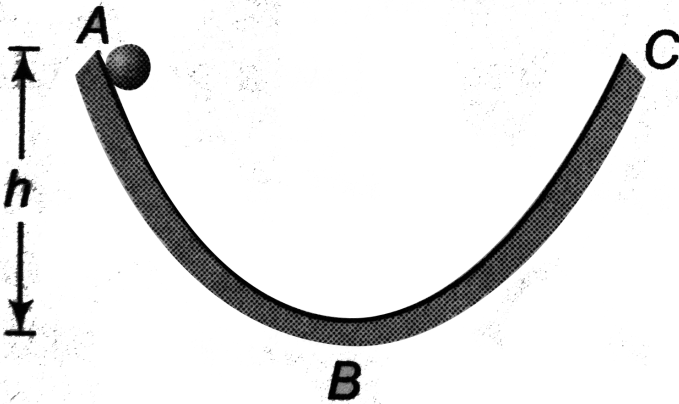
A. (a)  $2 \times 10^{10}$

B. (b)  $2 \times 10^{-8}$

C. (c)  $2 \times 10^8$

D. (d)  $2 \times 10^{-10}$

**Answer: D**



35.

A solid ball rolls down a parabolic path ABC from a height  $h$  as shown in figure. Portion AB of the path is rough while BC is smooth. How high will the ball climb in BC?

A.  $H = \frac{5}{7}h$

B.  $H = \frac{5}{2}h$

C.  $H = \frac{7}{5}h$

D.  $H = \frac{3}{7}h$

**Answer: A**



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**36.** A circular disc rolls down an inclined plane . The ratio of rotational kinetic energy to total kinetic energy is

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

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

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

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

**Answer: B**



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**37.** A p-n junction in series with a resistance of  $5k\Omega$  is connected across a 50 V DC source . If the forward bias resistance of the junction is  $50\Omega$  , the forward bias current is

A. (a)1 mA

B. 2 mA

C. 20 mA

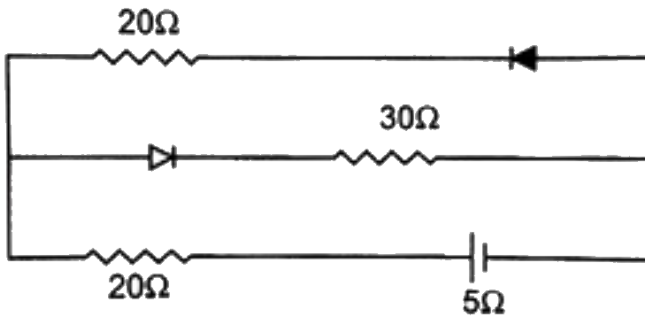
D. 9.9 mA

**Answer: D**



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38. Current in the given circuit will be



A.  $\frac{5}{40} A$

B.  $\frac{5}{50} A$

C.  $\frac{5}{10} A$

D.  $\frac{5}{20} A$

**Answer: B**



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**39.** What is the molar specific heat capacity of a gas undergoing an adiabatic process ?

A. Zero

B. 1

C.  $\infty$

D. None of these

**Answer: A**



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40. Which of the following is dimensionless ?

A.  $\frac{v^2}{rg}$

B.  $\frac{v^2 g}{r}$

C.  $\frac{vg}{r}$

D.  $v^2 rg$

**Answer: A**



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41. If there is zero absorption in the polaroid and if the intensity of plane - polarized light coming out of polaroid is  $A^2$ , then the intensity of the incident beam will be

A.  $A^2$

B.  $\frac{A^2}{2}$

C.  $2A^2$

D. None of these

**Answer: C**



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42. In Young's double slit experiment, one of the slit is wider than other, so that the amplitude of the light from one slit is double of that from other slit. If  $I_m$  be the maximum intensity, the resultant intensity  $I$  when they interfere at phase difference  $\phi$  is given by

A.  $\frac{I_m}{9} \left( 1 - 8 \cos^2 \cdot \frac{\phi}{2} \right)$

B.  $\frac{I_m}{9} \left( 1 + 8 \cos^2 \cdot \frac{\phi}{2} \right)$

C.  $\frac{I_m}{9} (1 - 8 \cos^2 \phi)$

D.  $\frac{I_m}{9} \left( 1 - \sin^2 \cdot \frac{\phi}{2} \right)$

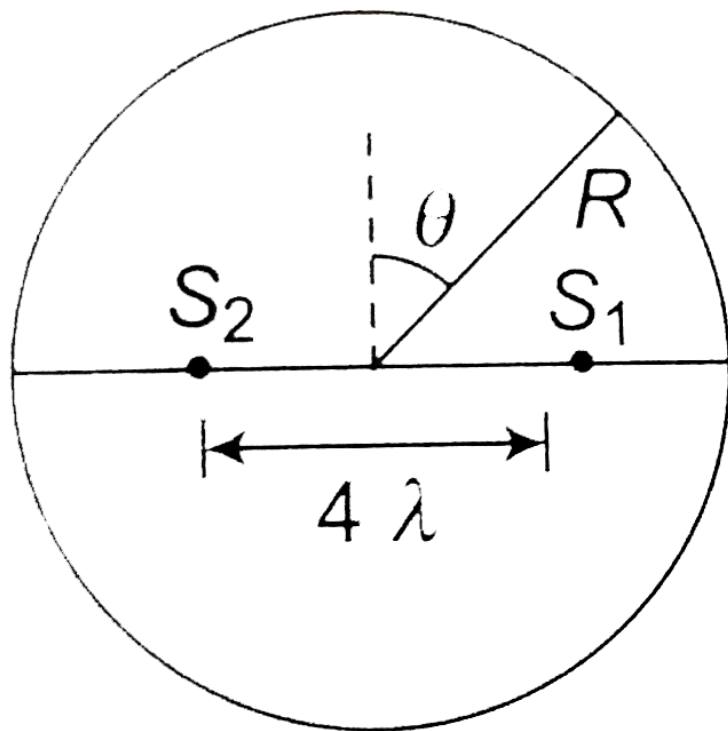
**Answer: B**



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**43.** Two sources of sound are placed along the diameter of a circle of radius  $R$  ( $R > \lambda > 4\lambda$ ). How many minima will be heard as one moves along the

perimeter of circle.



A. 16

B. 12

C. 4

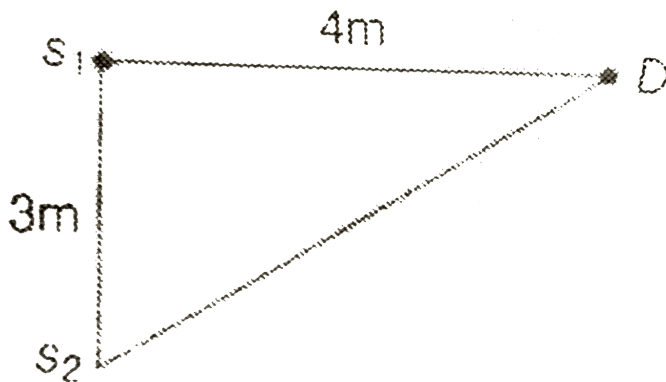
D. 8

Answer: A



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44. In the figure, the intensity of waves arriving at D from two coherent sources  $s_1$  and  $s_2$  is  $I_0$ . The wavelength of the wave is  $\lambda = 4m$ . Resultant intensity at D will be



A.  $4I_0$

B.  $I_0$

C.  $2I_0$

D. Zero

**Answer: C**



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**45.** How much work must work be done by a force on 50 kg body in order to accelerate it in the direction of force from rest to  $20ms^{-1}$  is 10 s?

A.  $10^3 J$

B.  $10^4 J$

C.  $2 \times 10^3 J$

D.  $4 \times 10^4 J$

**Answer: B**



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