



PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 50

Physics

1. A hydrogen atom initially in the ground state absorbs a photon which excites it to the

$n=4$ level. Estimate the frequency of the photon.

A. $3.1 \times 10^{15} \text{ Hz}$

B. $3.1 \times 10^{14} \text{ Hz}$

C. $9.7 \times 10^{15} \text{ Hz}$

D. $9.7 \times 10^{14} \text{ Hz}$

Answer: A



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2. A ball of mass 0.12kg is moving with a speed 20m/s . Calculate the de Broglie wavelength.

(planck constant $h = 6.62 \times 10^{-34}\text{J}\cdot\text{s}$)

A. $3.5 \times 10^{-34}\text{m}$

B. $2.8 \times 10^{-34}\text{m}$

C. $1.2 \times 10^{-34}\text{m}$

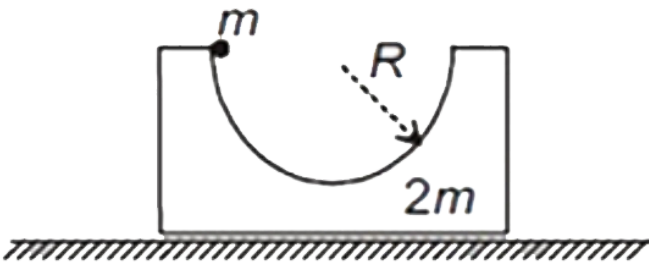
D. $2.1 \times 10^{-34}\text{m}$

Answer: B



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3. A small ball of mass m is released from rest from the position shown. All contact surfaces are smooth. The speed of the ball when it reaches its lowest position is



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

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

C. \sqrt{gR}

D. $\sqrt{2gR}$

Answer: B



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4. The angle between vectors \vec{A} and \vec{B} is 60° . What is the ratio $\vec{A} \cdot \vec{B}$ and $|\vec{A} \times \vec{B}|$

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

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

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

D. $\frac{1}{\sqrt{5}}$

Answer: B



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5. For a particle moving along circular path, the radial acceleration a_x is proportional to time t . If a_t is the tangential acceleration, then which of the following will be independent of time t .

A. a_t

B. $a_r a_t$

C. $\frac{a_r}{a_t}$

D. $a_r (at)^2$

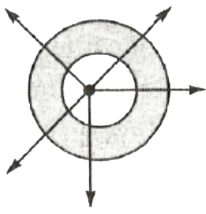
Answer: D



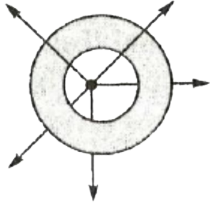
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6. A metallic shell has a point charge 'q' kept inside its cavity. Which one of the following diagrams correctly represents the electric lines of forces?

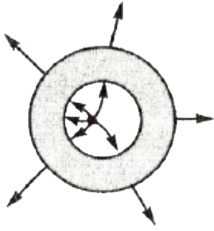
A.



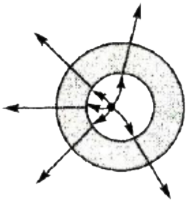
B.



C.



D.



Answer: C



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7. An electric bulb rated for $500W$ at $100V$ is used in a circuit having a $200V$ supply. The resistance R that must be put in series with bulb, so that the bulb delivers $500W$ is Ω .

A. 18Ω

B. 20Ω

C. 40Ω

D. 700Ω

Answer: B



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8. An electric current is passed through a circuit containing two wires of the same material, connected in parallel. If the lengths and radii are in the ratio of $\frac{4}{3}$ and $\frac{2}{3}$, then the ratio of the current passing through the wires will be

A. 3

B. $8/9$

C. 2

D. $1/3$

Answer: D



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9. A step-down transformer is used on a $1000V$ line to deliver $20A$ at $120V$ at the secondary coil. If the efficiency of the

transformer is 80% the current drawn from the line is.

A. $3A$

B. $30A$

C. $0.3A$

D. $2.4A$

Answer: A



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10. A charge of magnitude $1.6 \times 10^{-19} C$ moving in a circle of radius 5 cm in a uniform magnetic field 0.5 T. After applying $E = 0.15 V m^{-1}$ charge starts moving in a straight line. Mass of charge will be

A. $\frac{2}{3} \times 10^{-20} kg$

B. $\frac{4}{3} \times 10^{-20} kg$

C. $\frac{6}{3} \times 10^{-20} kg$

D. $\frac{1}{3} \times 10^{-20} kg$

Answer: B



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11. A charge Q is divided into two charge q and $Q-4$ The value of q such that the force between them is maximum is

A. Q

B. $\frac{3Q}{4}$

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

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

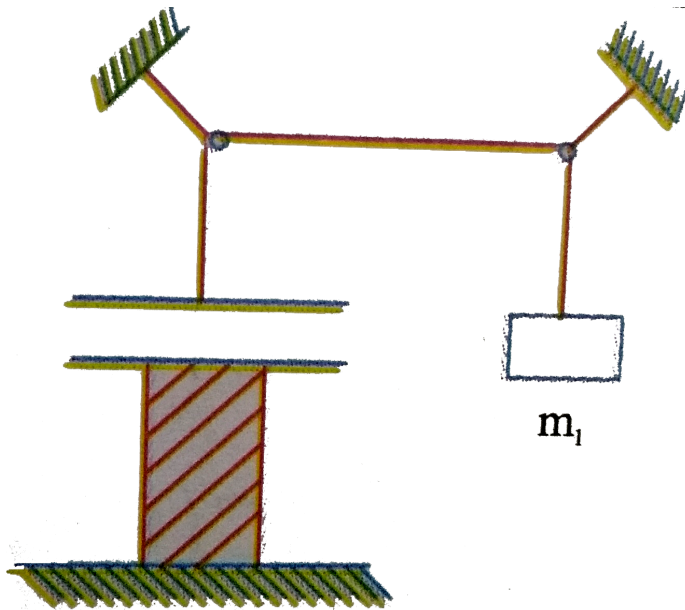
Answer: C



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12. In the given figure a capacitor of plate area A is charged upto charge q . The mass of each plate is m_2 . The lower plate is rigidly fixed. The value of m_1 if the system remains in

equilibrium is.



A. $m_2 + \frac{q^2}{\epsilon_0 A g}$

B. m_2

C. $\frac{q^2}{2A\epsilon_0 g} + m_2$

D. None of these

Answer: C



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13. A car is standing 200m behind a bus , which is also at rest . The two. Start moving at the same instant but with different forward accelerations. The bus has acceleration $2ms^{-2}$ and The car has acceleration $4ms^{-2}$
The car will catch up will the bus after time :

A. $\sqrt{120}s$

B. 15 s

C. $\sqrt{110}s$

D. $10\sqrt{2}s$

Answer: D



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14. Two spherical bodies of mass M and $5M$ & radii R & $2R$ respectively are released in free space with initial separation between their centres equal to $12R$. If they attract each other

due to gravitational force only, then the distance covered by the smaller body just before collision is

A. $2.5 R$

B. $4.5 R$

C. $1.5 R$

D. $7.5 R$

Answer: D



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15. A mass m is raised from a distance $2R$ from the surface of the earth to $3R$. Work done to do so against gravity will-

A. $\frac{mgR}{10}$

B. $\frac{mgR}{11}$

C. $\frac{mgR}{12}$

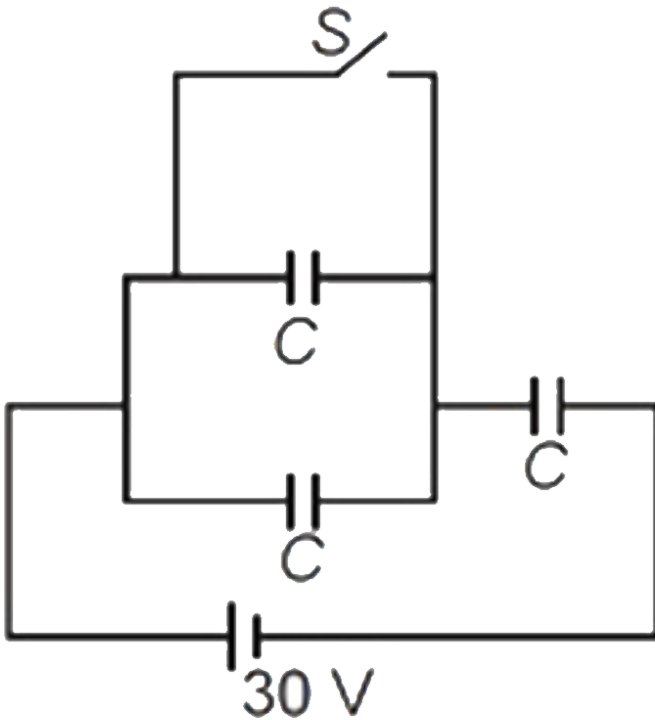
D. $\frac{mgR}{14}$

Answer: C



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16. Three capacitors each of capacitance $C = 2\mu F$ are connected with a battery of emf 30 V as shown in the figure . When the switch S is closed , the heat generated in the circuit will be



A. 0.15 mJ

B. 0.30 mJ

C. 0.10 mJ

D. 0.60 mJ

Answer: B



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17. Two identical objects A and B are at temperatures T_A and T_B . Respectively. Both objects are placed in a room with perfectly

absorbing walls maintained at a temperature T ($T_A > T > T_B$). The objects A and B attain the temperature T eventually. Select the correct statements from the following:

A. A only emits radiations while B only absorbs it until both attain the temperature T

B. A loses more heat by radiation than it absorbs, while B absorbs more radiation than it emits until they attain the temperature T

C. Both A and B only absorb radiation but do not emit it, until they attain the temperature T.

D. B only emits radiations , while A only absorbs it until both attain the temperature T

Answer: B



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18. The temperature of source of a Carnot engine of efficiency 20% when the heat exhausted is at 240 K is

A. 1200 K

B. 600 K

C. 540 K

D. 300 K

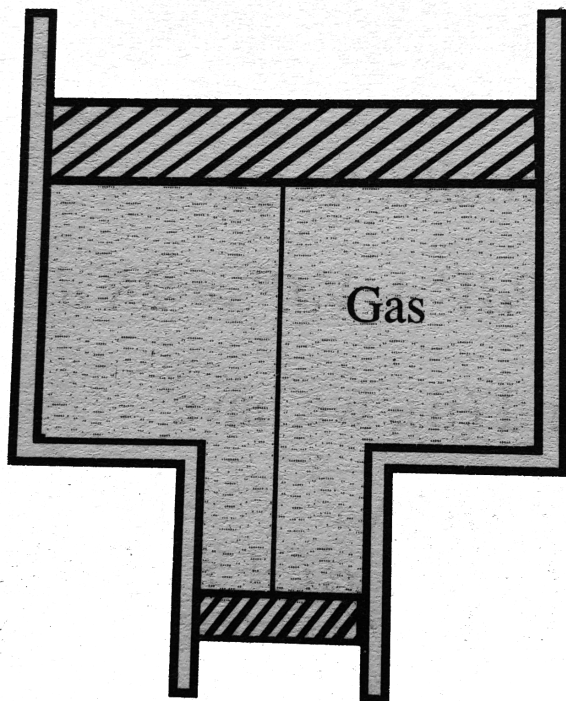
Answer: D



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19. A smooth vertical tube having two different cross sections is open from both the ends but closed by two sliding pistons as shown in Fig. and tied with an inextensible string. One mole of an ideal gas is enclosed between the piston. The difference in cross-sectional areas of the two pistons is given ΔS . The masses of piston are m_1 and m_2 for larger and smaller one, respectively. Find the temperature by which tube is raised so that the pistons will be displaced by a distance l . Take atmospheric

pressure equal to P_0



A. $T_2 - T_1 = \frac{pl\Delta S}{R}$

B. $T_2 - T_1 = Pl\Delta S$

C. $T_2 - T_1 = \frac{pl\Delta S}{lR}$

$$D. T_2 - T_1 = \frac{R}{pl\Delta S}$$

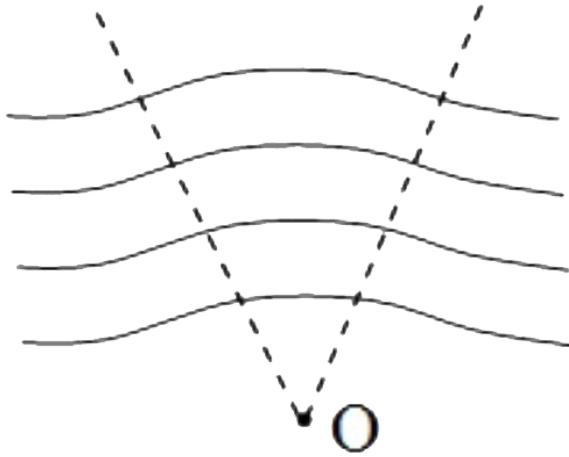
Answer: A



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20. If the electric lines of force are shaped like arcs of concentric circles with their centre at point O in a certain section of an electric field ,

then



A. The intensity of the field in this section should at each point be inversely proportional to its distance from point O

B. The intensity of the field in this section should at each point be inversely proportional to square of its distance from point O

C. The intensity of the field in this section should at each point be inversely proportional to cube of its distance from point O

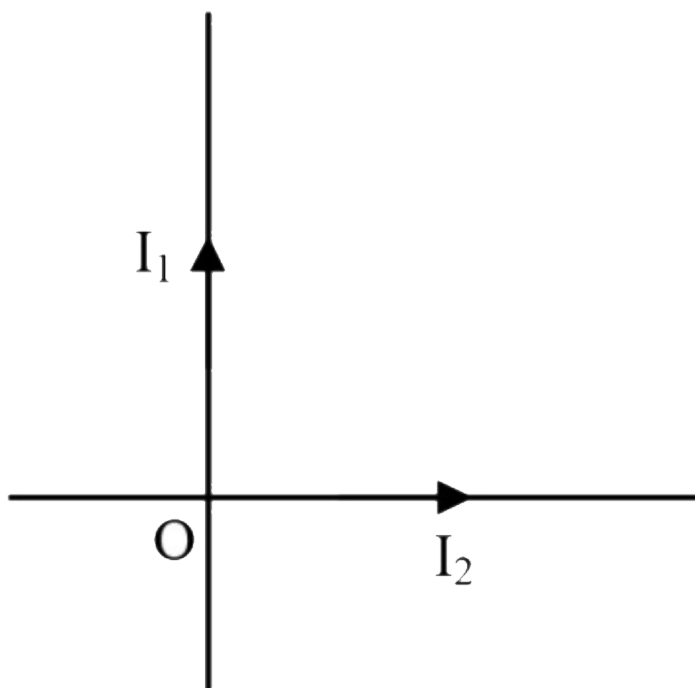
D. Nothing can be said

Answer: A



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21. Two long wires carrying current are kept crossed (not joined at) . The locus where magnetic field is zero is -



A. $I_1 = \frac{x}{y} I_2$

B. $I_1 = \frac{y}{x} I_2$

C. $I_1 = I_2$

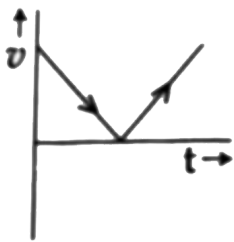
D. $I_1 = -I_2$

Answer: A

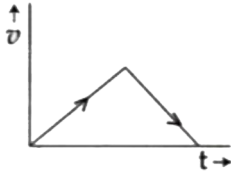


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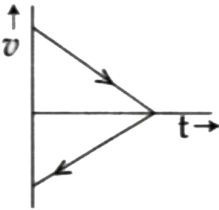
22. A body is thrown vertically upwards. Which one of the following graphs correctly represent the velocity vs time?



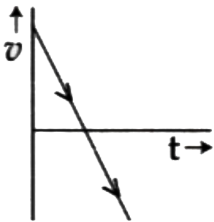
A.



B.



C.



D.

Answer: D



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23. man wants to swim across a river of which 200 m along the shortest path . If the speed of river stream is $3kmh^{-1}$ and speed of swimmer in still water is $5kmh^{-1}$, then the time of crossing the river is

A. 10 min

B. 15 min

C. 3 min

D. 6 min

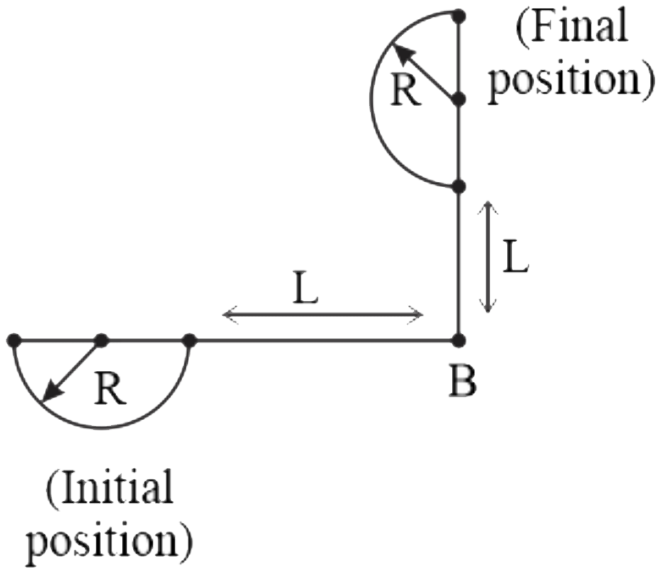
Answer: C



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24. The figure below shows an axe which has a massless handle of length L and a blade of mass M and radius R . The man slowly raises the axe from the horizontal position to the vertical position by rotating it about its point B . Find the work done by him on the axe

during the process .



A. $Mg \left[L + R + \frac{4R}{3\pi} \right]$

B. $Mg \left[\left(-\frac{4R}{3\pi} \right) + L \right]$

C. MgL

D. $Mg \left[\frac{4R}{3\pi} + L \right]$

Answer: A



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25. A block of mass 1 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 $5m/s^2$, the frictional force acting on the block is..... newtons.

A. 5 N

B. 6 N

C. 10 N

D. 15 N

Answer: A



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26. Two radioactive materials X_1 and X_2 have decay constants 10λ and λ respectively. If initially they have the same number of nuclei,

then the ratio of the number of nuclei of X_1 to that of X_2 will be $1/e$ after a time.

A. $\frac{1}{10\lambda}$

B. $\frac{1}{11\lambda}$

C. $\frac{11}{10\lambda}$

D. $\frac{1}{9\lambda}$

Answer: D



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27. The atomic mass of ${}_{7}^{15}\text{N}$ is 15.000108amu and that of ${}_{8}^{16}\text{O}$ is 15.994915amu. The minimum energy required to remove the least tightly bound proton is (mass of proton is 1.007825amu)

A. 0.013018 amu

B. 12.13 MeV

C. 13.018 meV

D. 12.13 eV

Answer: B



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28. Time period of a particle executing *SHM* is 8 sec. At $t = 0$ it is at the mean position. The ratio of the distance covered by the particle in the 1st second to the 2nd second is:

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

B. $\sqrt{2}$

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

D. $\sqrt{2} + 1$

Answer: D



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29. A pendulum has maximum kinetic energy K_1 If its length is doubled keeping amplitude same then maximum kinetic energy becomes K_2 .Then relation between K_1 and K_2 is

A. $K_2 = 2K_1$

B. $K_1 = 2K_2$

C. $K_2 = K_1$

D. $K_1 = 4K_2$

Answer: A



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30. Moving with the same velocity . One of the following has the longest deBroglie wavelength

A. β - particle

B. α - particle

C. Proton

D. Neutron

Answer: A



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31. According to Einstein's photoelectric equation, the plot of the maximum kinetic energy of the emitted photoelectrons from a

metal versus frequency of the incident radiation gives a straight line whose slope

A. depends on the nature of the metal used

B. depends on the intensity of the radiation

C. depends both on the intensity of the radiation and the metal used

D. is the same for all metals and is independent of the intensity of the

radiation

Answer: D



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32. A cubical block of side 0.5 m floats on water with 30% of its volume under water. What is the maximum weight that can be put on the block without fully submerging it under water?

[Take, density of water = 10^3 kg/m^3]

A. 87.5 kg

B. 65.4 kg

C. 30.1 kg

D. 46.3 kg

Answer: A



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33. 32 g of O_2 is contained in a cubical container of side 1 m and maintained at a temperature of $127^\circ C$. The isothermal bulk

modulus of elasticity of the gas is (universal
gas constant = R)

A. 127 R

B. 400 R

C. 200 R

D. 560 R

Answer: B



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34. An astronomical telescope has an angular magnification of magnitude 5 for distant object. The separation between the objective and eyepiece is 36cm and the final image is formed at infinity. Determine the focal length of objective and eyepiece.

A. 45 cm and - 9 cm

B. 50 cm and 10 cm

C. 72 cm and 5 cm

D. 30 cm and 6 cm

Answer: D



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35. A thin rod of 5 cm length is kept along the axis of a concave mirror of 10 cm focal length such that its image is real and magnified and one end touches the rod. Its magnification will be

A. 1

B. 2

C. 3

D. 4

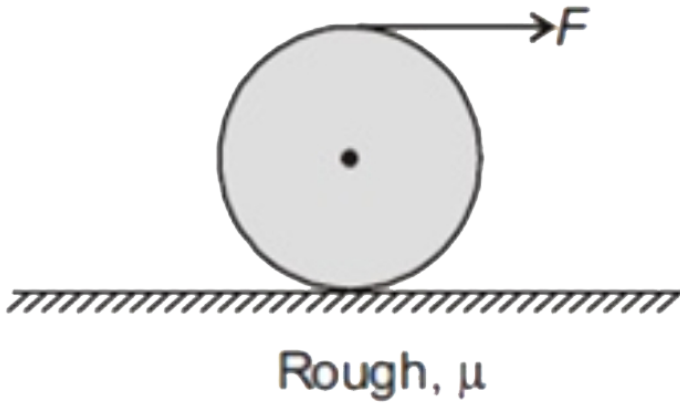
Answer: B



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36. A solid sphere of mass M and radius R is pulled by a force F as shown in figure . If the sphere does not slip over the surface , then

frictional force acting on the sphere is



A. $\frac{2F}{7}$

B. $\frac{3F}{7}$

C. $\frac{2F}{5}$

D. Zero

Answer: B



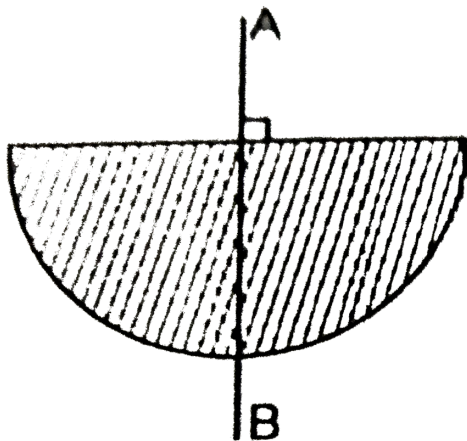
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37. A uniform semicircular disc of mass ' m ' and radius ' R ' is shown in the figure. Find out its moment of inertia about.

(a) axis ' AB ' (shown in the figure 0 which passes through geometrical centre and lies in the plane of the disc

(b) axis ' CD ' which passes through its centre of mass and it is perpendicular to the plane of

the disc.



A. $\frac{MR^2}{2} - M\left(\frac{2R}{\pi}\right)^2$

B. $\frac{MR^2}{2} - M\left(\frac{4R}{\pi}\right)^2$

C. $\frac{MR^2}{2} + M\left(\frac{4R}{3\pi}\right)^2$

D. $\frac{MR^2}{2} + M\left(\frac{2R}{\pi}\right)^2$

Answer: B



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38. The energy band gap is maximum in

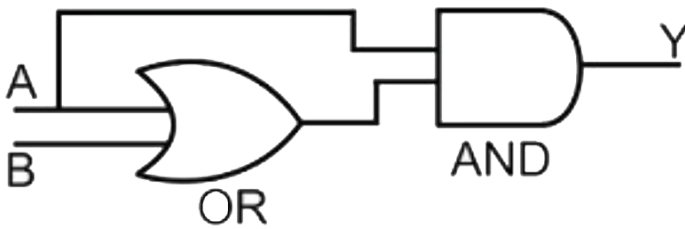
- A. metals
- B. superconductors
- C. insulators
- D. semiconductors

Answer: C



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39. The output Y of the combination of logic gates shown is equal to



A. A

B. \bar{A}

C. $A + B$

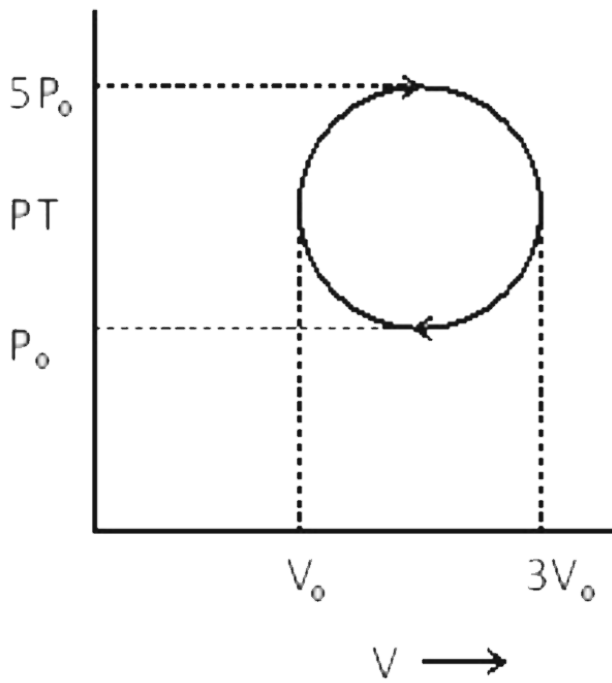
D. AB

Answer: A



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40. P – V graph for a cyclic process is shown in figure . Work done is given by



- A. $\pi P_0 V_0$
- B. $15 P_0 V_0$
- C. $8 P_0 V_0$
- D. $2\pi P_0 V_0$

Answer: D



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41. A resistor of $6k\Omega$ with tolerance 10% and another resistance of $4k\Omega$ with tolerance 10% are connected in series. The tolerance of the combination is about

A. 10 %

B. 20 %

C. 30 %

D. 40 %

Answer: C



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42. A single slit of width 0.1 mm is illuminated by a parallel beam of light of wavelength 6000\AA and diffraction bands are observed on a screen 0.5 m from the slit. The distance of the third dark band from the central bright band is _____ mm.

A. 9 mm

B. 3 mm

C. 4.5 mm

D. 1.5 mm

Answer: A



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43. In Young's double slit experiment, the distance between slits and the screen is 1.0 m and monochromatic light of 600 nm is being

used. A person standing near the slits is looking at the fringe pattern. When the separation between the slits is varied, the interference pattern disappears for a particular d_0 between the slits

A. 1 mm

B. 3 mm

C. 2 mm

D. 4 mm

Answer: C



44. A set of 56 tuning forks is arranged in series of increasing frequencies. If each fork gives 4 beats with preceding one and the frequency of the last is twice that of first, then frequency of the first fork is

- A. 110 Hz
- B. 220 Hz
- C. 224 Hz
- D. 448 Hz

Answer: B



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45. A segment of wire vibrates with a fundamental frequency of 450 Hz under a tension of 9Kg-wt. Then, tension at which the fundamental frequency of the same wire becomes 900 Hz is

A. 36 kg - wt

B. 27 kg - wt

C. 18 kg - wt

D. 72 kg - wt

Answer: A



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