JEE-Main-09-04-2024 (Memory Based)
[MORNING SHIFT]

Physics

Question: The dimension of latent heat is:

Options:

(a) $[M^0L^2T^{-1}]$

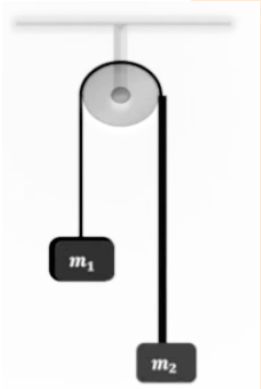
(b) $[M^0L^2T^{-2}]$

(c) $[M^0LT^{-2}]$

(d) $[M^{-1}L^2T^{-2}]$

Answer: (b)

Question: In the pulley-block system shown, the pulley and the block are ideal. If the acceleration of the block is g/8, find $m_1 : m_2$ (Given $m_2 > m_1$)



Options:

(a) 7 : 9

(b) 5 : 7

(c) 3 : 4

(d) 9 : 11

Answer: (a)

Question: Velocity of a particle of mass m as a function of displacement x is given by $v = \alpha\sqrt{x}$. Work done to move it from x = 0 to x = d is:

Options:

(a) $\frac{m\alpha^2}{2} \cdot d$

(b) $m\alpha^2 \cdot d$

(c) $3m\alpha^2 \cdot \frac{d}{2}$

(d) $2m\alpha^2 d$

Answer: (a)

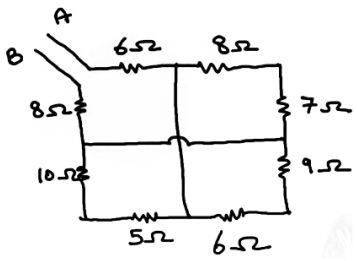
Question: Two persons are pulling a rope towards themselves with a force of 200 N each. If the Young's modulus is 2×10^{11} N/m^2 and area of cross-section is 2 cm^2 for the rope, the elongation in the rope is __
(distance between the persons holding the ropes is 2 m)
Options:
(a) 10 µm
(b) 20 µm
(c) 5 µm
(d) 40 µm
Answer: (a)

Question: A particle oscillating in simple harmonic motion such that its speed and acceleration at distance 2 m from mean position are 4 m/s and 16m/s^2 respectively. Find the amplitude of oscillation of the particle.
Options:
(a) √10 m
(b) √6 m
(c) √8 m
(d) √3 m
Answer: (b)

Question: Assertion (A): Object at radius of curvature of biconvex lens made by glass (µ = 1.5) form image at same distance an other side of the lens.
Reason (R): Image of a real object formed by concave lens is always virtual and erect.
Options:
(a) Both Assertion(A) and Reason(R) are the true and Reason(R) is a correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are the true but Reason(R) is a correct explanation of Assertion (A)
(c) Aseration (A) is true and Reason (R) is false
(d) Assertion (A) is false and Reason (R) is true
Answer: (b)

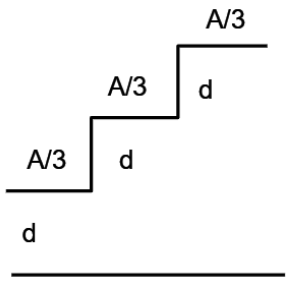
Question: The equivalent energy of 1 gm mass is equal to:
Options:
(a) 8.3×10^{26} M_eV
(b) 5.6×10^{26} M_eV
(c) 8.3×10^{12} M_eV
(d) 5.6×10^{12} M_eV
Answer: (b)

Question: Find the equivalent resistance between terminal A and B for the given network.



Options:
(a) 16 Ω
(b) 20 Ω
(c) 15 Ω
(d) 19 Ω
Answer: (d)

Question: Find the Equivalent capacitance from given diagram



Options:
(a) $11A\varepsilon_o/18d$
(b) $13A\varepsilon_o/18d$
(c) $15A\varepsilon_o/18d$
(d) $18A\varepsilon_o/11d$
Answer: (a)

Question: A monatomic gas is expanded adiabatically from 4V to 5V find ratio of initial and final Pressure?
Options:
(a) $5\sqrt{5}/8$
(b) $5\sqrt{7}/8$
(c) $5\sqrt{5}/7$
(d) $7\sqrt{5}/8$
Answer: (a)

Question: A gas is expanded adiabatically - initial temperature is T volume V. The final volume 2V then find work done in process
Options:
(a) $RT(2-\sqrt{2})$
(b) $R/T(2-\sqrt{2})$
(c) 2RT

(d) 5RT
Answer: (a)

Question: A half ring of radius R = 10 cm has linear charge density 4nC/m. Its potential at the centre is given as xπ V. Find x = ?
Options:
Answer: (36)

Question: Intensity at point is ¼ of max intensity. find its minimum distance from centre. Given wavelength 600 nm, d = 1mm, D = 1m
Options:
Answer: (200 μm)

Question: An astronaut takes a ball of mass m from earth surface. He throws the ball in the radius of 386.6. Then change in potential energy is xGMm/21R Find x.
Take radius of earth R = 6310 km.
Options:
Answer: (11)

Question: Rod weight W kept on shoulder of man inclined at angle θ find weight experienced
Options:
(a) W
(b) W/2
(c) W/4
(d) W/8
Answer: (b)

Question: Find the Ratio of De broglie wavelength of α - article, Electron & Proton
Options:
(a) $\lambda_\alpha < \lambda_p < \lambda_e$
(b) $\lambda_\alpha > \lambda_p > \lambda_e$
(c) $\lambda_\alpha > \lambda_p < \lambda_e$
(d) $\lambda_\alpha < \lambda_p > \lambda_e$
Answer: (a)

Question: If a bulb and capacitor are connected in series and then capacitor is inserted with a dielectric then
Bulb's intensity
Options:
(a) Increases
(b) Decreases
(c) Remains same
(d) Becomes 0
Answer: (a)