JEE-Main-30-01-2024 (Memory Based)
[EVENING SHIFT]

Physics

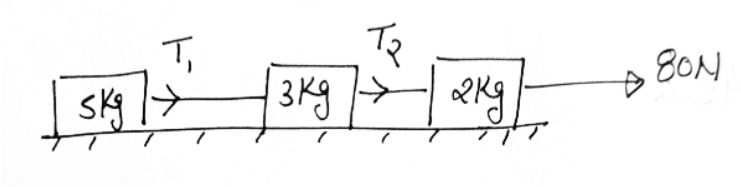
Question: Two polarisers A and B are kept one after the other. Their pass axis makes an angle of 45 with each other. An unpolarized light of intensity I_0 strikes A first and then B. Find the intensity of the light emergent from B.
Options:
(a) $\frac{I_0}{2}$
(b) $\frac{I_0}{4}$
(c) $\frac{I_0}{8}$
(d) $\frac{I_0}{6}$
Answer: (b)

Question: Simple pendulum of length 'l = 4' is taken to height 'R' above earth surface calculate time period at its height {R → Radius of Earth & Taken $\pi^2 = g$}
Options:
(a) 4 sec
(b) 8 sec
(c) 2 sec
(d) 10 sec
Answer: (b)

Question: If for a given planet $R_P = \frac{1}{3}R_E$ & $M_P = \frac{1}{6}M_E$ then find the escape speed for this planet if the escape speed of earth is 11.2 km/hr
Options:
(a) 7.9 km/hr
(b) 11.2 km/hr
(c) 7.9 m/s
(d) 8.5 m/s
Answer: (a)

Question: A block of mass 1 kg is pulled up on an inclined plane 60° by a force of 10 N. Coefficient of friction is μ = 0.1. Find the magnitude of Work done by the friction by the time block moves up by 10 m.
Options:
(a) 5×10^{-2} J
(b) 5 J
(c) 5000 J
(d) 500 J
Answer: (b)

Question: Find the Tension T_1 & T_2 in the given system



Options:
(a) $T_1 = 40, T_2 = 64$
(b) $T_1 = 64, T_2 = 40$
(c) $T_1 = 30, T_2 = 64$
(d) $T_1 = 40, T_2 = 30$
Answer: (a)

Question: Find value of P is the dimensional equation
$M^1 = [C^P G^{-½} h^{1/2}]$
(1) → C → speed of light
(2) → G → Universal gravitational constant
(3) → h → Planck's constant
Options:
(a) 1
(b) ½
(c) -½
(d) -1
Answer: (b)

Question: Charge -q rotating around infinite long wire having charge density ρ at distance r then calculate the time period of that -q Charge.
Options:
(a) $2\pi\sqrt{\frac{mr^2}{2k\rho q}}$
(b) $\pi\sqrt{\frac{mr^2}{2k\rho q}}$
(c) $2\pi\sqrt{\frac{mr^2}{k\rho q}}$
(d) $\pi\sqrt{\frac{mr^2}{k\rho q}}$
Answer: (a)

Question: Match the following

A	$\oint \vec{B} \cdot d\vec{A} = 0$	P	Faraday & lenz's law
B	$\oint \vec{E} \cdot d\vec{A} = \frac{Q_{in}}{E_0}$	Q	Gauss law on magnetism
C	$\oint \vec{B} \cdot d\vec{l} = \mu_0 i_{(enclosed)}$	R	Ampere's law

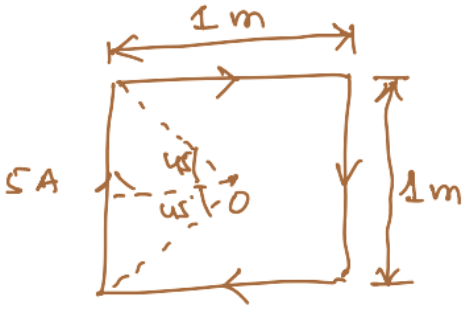
D	$\phi\vec{E}\cdot d\vec{l}=\frac{-d\phi_8}{dt}$	S	Gauss law of Electrostatics

Options:
(a) A → Q, B → S, C → R, D → P
(b) A → S, B → S, C → P, D → R
(c) A → S, B → Q, C → R, D → P
(d) A → Q, B → P, C → S, D → R
Answer: (a)

Question: If 1000 drops of surface energy E_1 are merged to form 1 bigger drop of Surface Energy E_2 then E_1 / E_2 is _____

Question: 2 moles of monatomic gas (γ = 3/2) is mixed with 3 moles of diatomic gas (γ = 5/7).
Find γ of the mixture here $\gamma = C_p/C_V$.
Options:
(a) 5/3
(b) 29/19
(c) 11/7
(d) 39/29
Answer: (b)

Question: Magnetic field at 'O' is $x\sqrt{2} \times 10^{-7}$ Tesla. Find x.



Options:
Answer: (40)

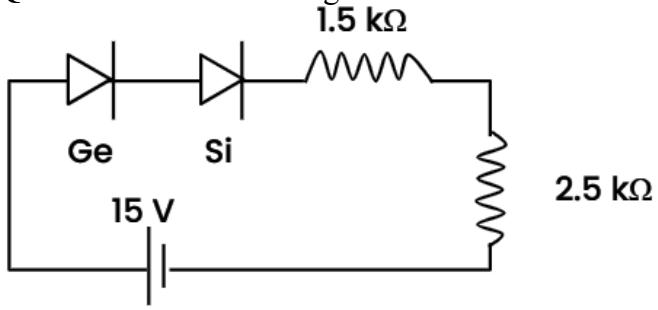
Question: Magnetic moment of electron is proportional to n^p find P
Options:
(a) 3
(b) 2
(c) 4
(d) 1
Answer: (d)

Question: Heat developed in wire is H if wire is cut in 2 equal parts and joined in parallel then new heat dissipated will be?
Options:
(a) H

(b) 2H
(c) 3H
(d) 4H
Answer: (d)

Question: Number of spectral line for He+ for Transition from n = 5 to 1
Options:
(a) 6
(b) 10
(c) 12
(d) 3
Answer: (b)

Question: Find the Voltage Across 2.5 kΩ



Options:
(a) 8.75 V
(b) 7.75 V
(c) 6.75 V
(d) 5.75 V
Answer: (a)

Question: A disc of Moment of inertia 4 kgm^2 is spinning freely at 10 rad/s, a second disc of Moment of Inertia 2 Kgm^2 at angular speed 4 rad.s is put on the first disc and finally they both rotate with same angular speed. What is the change in KE?
Answer: (24)