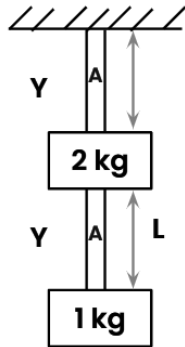


JEE-Main-01-02-2024 (Memory Based)

[EVENING SHIFT]

Physics

Question: Find Ratio of Strains in wire 1 & 2



Options:

- (a) 3:1
- (b) 1:4
- (c) 1:3
- (d) 4:1

Answer: (a)

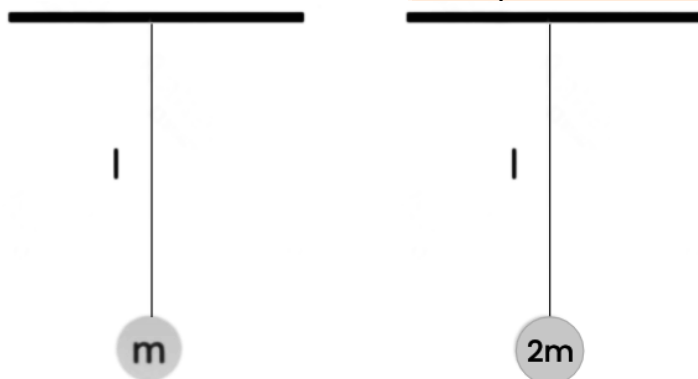
Question: 2 trains run on N-S trace. Train moves with a velocity 20 m/s towards north and train (B) moves with a velocity 30 m/s towards south.

Options:

- (a) $-50\hat{j}$
- (b) $50\hat{j}$
- (c) $-30\hat{j}$
- (d) $30\hat{j}$

Answer: (a)

Question: Find the ratio T_i/T_{ii} of time periods of the two pendulums shown.



Options:

- (a) 1
- (b) $\frac{1}{2}$

- (c) 2
(d) $\frac{1}{4}$

Answer: (a)

Question: A solid sphere is rolling purely with speed v on horizontal surface. It rolls up an incline surface and stops at height h . Then height h is [g is the acceleration due to gravity]

Options:

- (a) $\frac{3}{10} \frac{v^2}{g}$
(b) $\frac{7}{10} \frac{v^2}{g}$
(c) $\frac{5}{7} \frac{v^2}{g}$
(d) $\frac{7}{5} \frac{v^2}{g}$

Answer: (b)

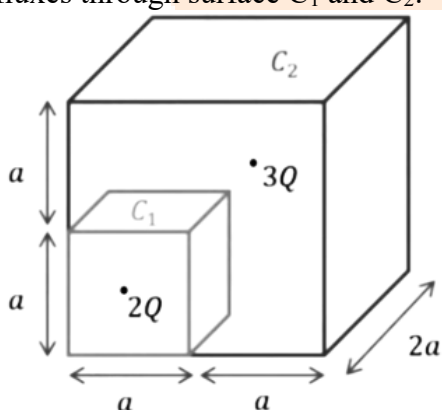
Question: If the power of a light source is P and frequency of photons emitted is f . Find number photons emitted in time t .

Options:

- (a) $\frac{Pt}{2hf}$
(b) $\frac{Pt}{hf}$
(c) $\frac{1}{2} \frac{pf}{ht}$
(d) $\frac{Pf}{ht}$

Answer: (b)

Question: There are two cubical Gaussian surface carrying charges as shown. Find ratio of fluxes through surface C_1 and C_2 :



Options:

- (a) 1 : 1
(b) 2 : 5
(c) 5 : 2
(d) 2 : 3

Answer: (b)

Question: Find the number of significant digits in the value 10.05

Options:

Answer: (4)

Question: $\vec{F}_1 = 6\hat{i} + 3\hat{j} + 1\hat{k}$, $\vec{F}_2 = 2\hat{i} + 1\hat{j} + 3\hat{k}$ Act on 4kg. Find \vec{a}

Options:

(a) $\vec{a} = 2\hat{i} + 1\hat{j} + 1\hat{k}$

(b) $\vec{a} = 2\hat{i} - 1\hat{j} + 1\hat{k}$

(c) $\vec{a} = 2\hat{i} - 1\hat{j} - 1\hat{k}$

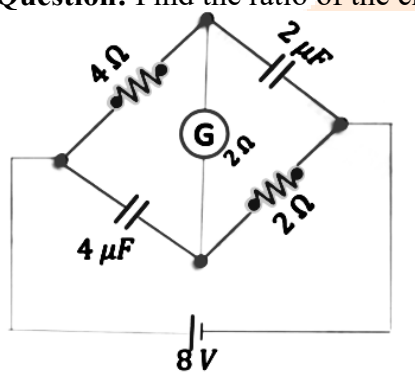
(d) $\vec{a} = 2\hat{i} + 1\hat{j} - 1\hat{k}$

Answer: (a)

Question: A ball of mass 120 g moving with initial velocity 25 m/s is stopped by an external force F in 0.15 sec. Find value of F in newton:

Answer: (20)

Question: Find the ratio of the charge on $4\ \mu\text{F}$ to that on $2\ \mu\text{F}$ in steady state.



Options:

Answer: (3)

Question: A source produces electromagnetic waves of frequency 60 MHz. Find the wavelength of this wave in air.

Options:

Answer: (5)

Question: Efficiency of transformer is 80%, Where input voltage is 10v and input power is 20W in primary. Find current in secondary when voltage is 240 V

Options:

(a) 5.67×10^{-2} A

(b) 4.67×10^{-2} A

(c) 5.67×10^{-2} A

(d) 6.67×10^{-2} A

Answer: (d)

Question: In an isobaric process work done by the gas is 200 J. Adiabatic constant for the gas is 1.4 then find the heat supplied to the gas in the process.

Options:

(a) 500 J

(b) 600 J

(c) 700 J

(d) 800 J

Answer: (c)

Question: 1000 drops of surface energy E_1 , coalesce to form one bigger drop of surface energy E_2 . Find the value of E_2/E_1

Options:

- (a) 1:10
- (b) 1:9
- (c) 1:100
- (d) 100:1

Answer: (a)

Question: A charged particle suspended by thread 20 cm mass in 2 gm and horizontal $E = 2 \times 10^4$ N/C. if charge is $1/\sqrt{x}$ μC then find x

Options:

Answer: (3)

Question: Gravitational force of attraction depends on radius of circular motion performed by satellite find dependance of time period on radius

Options:

- (a) $T^2 \propto r^{1/2}$
- (b) $T^2 \propto r^{3/2}$
- (c) $T^2 \propto r^{5/2}$
- (d) $T^2 \propto r^{7/2}$

Answer: (c)

Question: Resistance of Galvanometer is G which is converted into Ammeter. If 0.5% of total current passes through the galvanometer, find resistance of Ammeter.

Options:

- (a) $G/100$
- (b) $G/200$
- (c) $G/199$
- (d) $200G$

Answer: (b)

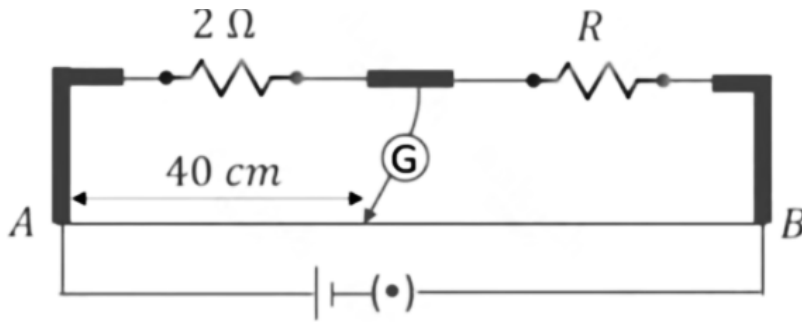
Question: If the rms velocity of hydrogen gas molecules is V_0 , find the rms velocity of oxygen molecules at same temperature:

Options:

- (a) V_0
- (b) $V_0/2$
- (c) $V_0/4$
- (d) $V_0/3$

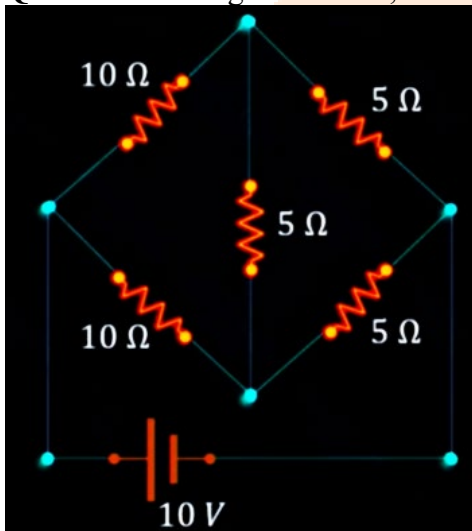
Answer: (c)

Question: In the meter bridge shown below, the null point is at 40 cm from A. If R is shunted by 2Ω , find the distance of new balance point from A



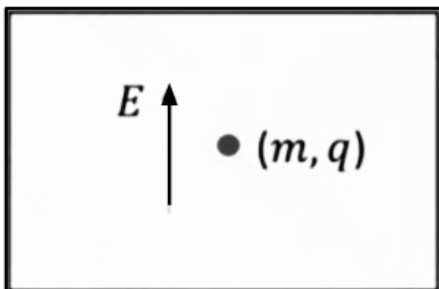
- Options:**
 (a) 22.7 cm
 (b) 60 cm
 (c) 62.5 cm
 (d) 60.5 cm
Answer: (c)

Question: In the given circuit, find electric current drawn from battery:



- Options:**
 (a) $\frac{3}{4}$ A
 (b) $\frac{4}{3}$ A
 (c) $\frac{4}{5}$ A
 (d) $\frac{5}{4}$ A
Answer: (b)

Question: A charged particle (m, q) in vertical plane stays in equilibrium in an electric field as shown. Find the value of q .



Options:

- (a) $\frac{mg}{2E}$
- (b) $\frac{mg}{E}$
- (c) $\frac{E}{2mg}$
- (d) $\frac{mg}{4E}$

Answer: (b)

Question: In Young's double slit experiment, slits separation is 4 cm and separation between slit and screen is 1.5 m. A wave of wavelength 2 cm is incident of slits then find angular width of fridge:

Options:

- (a) 0.75 rad
- (b) 0.65 rad
- (c) 0.80 rad
- (d) 0.5 rad

Answer: (d)

Question: In transition from $n = 2$ to $n = 1$ in hydrogen atom, frequency emitted is f_0 . The frequency for the transition $n = 3$ to $n = 1$ is

Options:

- (a) $\frac{27}{32} f_0$
- (b) $\frac{25}{18} f_0$
- (c) $\frac{32}{27} f_0$
- (d) $\frac{18}{25} f_0$

Answer: (c)