JEE MAIN 2025

PAPER DISCUSSION

Attempt : 01
Date : 23rd Jan 2025
Shift : 01

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Sub : PHYSICS
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LIVE STREAMING

Statement 1: Surface tension of soap is greater than water.
Statement 2: Hot water flows faster than cold water.

A Statement I is true and Statement II is false.

B Statement I is false and Statement II is true.

C Both the statements are true.

D Both the statements are false.

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Electric Flux φ is related with linear charge density λ and surface charge density σ as $\varphi = \alpha\lambda + \beta\sigma$, here σ and β are of appropriate dimensions of (β/α) is

A Displacement

B Area

C Electric Field

D Velocity

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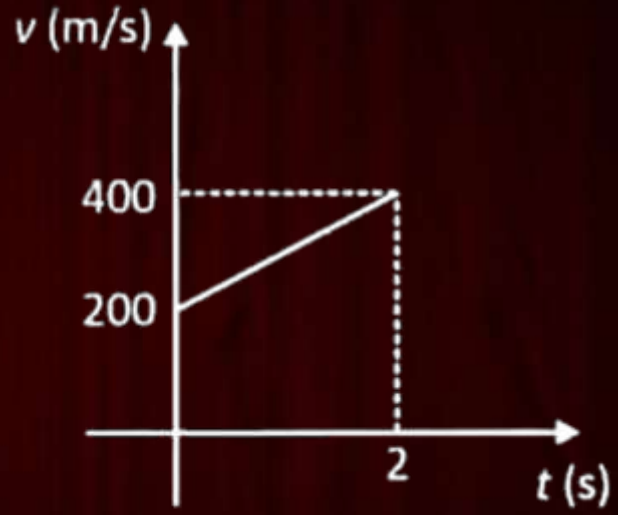
For given velocity – time (v – t) graph, find distance travelled at 0.5 sec.

A 125 m

B 112.5 m

C 135.m

D 150 m



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The displacement of a particle as function of time is $x(t) = A \sin(t) + B \cos^2(t) + ct^2 + D$. Find dimension of [ABC/D]

A L^2

B L^2T^{-2}

C LT^{-2}

D L^3T

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If the two projectile are projected with the same speed and the angles of projection for two projectiles are 30° and 60° then the ratio of velocities at maximum height is:

A $\sqrt{3} : 1$

B $1 : 2$

C $1 : 1$

D $1 : \sqrt{3}$

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An ideal gas at 0°C is suddenly compressed to 1/4 times of its initial volume. If the ratio of molar heat capacity at constant pressure to the molar heat capacity at constant volume is 3/2 find the difference between final temperature and initial temperature.

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A disc of radius 20 cm has its center at origin. If a disc of radius 5 cm is cut from it such that its edge touches the edge of the bigger disc, find the location of centre of mass of the new system.

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The ratio of electric force to gravitational force between two particles having charges q_1, q_2 and masses m_1 and m_2 respectively is (where symbols have their usual meanings)

A $\frac{4\pi\varepsilon_0 m_1 m_2 G}{q_1 q_2}$

B $\frac{4\pi\varepsilon_0 G m_1 m_2}{q_1 q_2 r^4}$

C $\frac{q_1 q_2 r^4}{4\pi\varepsilon_0 G m_1 m_2}$

D $\frac{q_1 q_2}{4\pi\varepsilon_0 m_1 m_2}$

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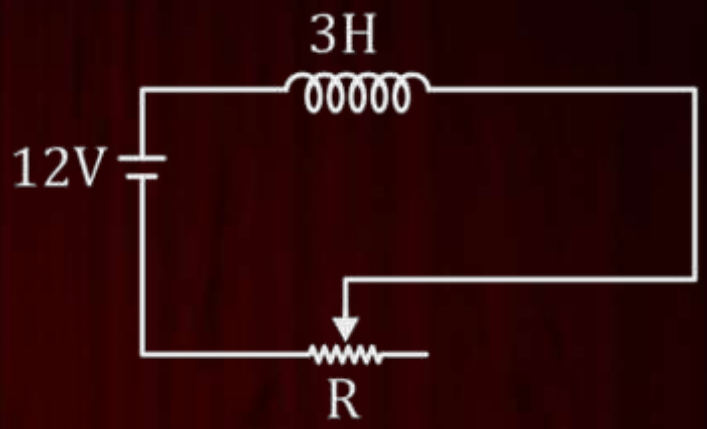
In given DC circuit, find current for R = 12 Ω in steady state.



A. 2 A

B. 1 A

C. 3 A

D. 4 A

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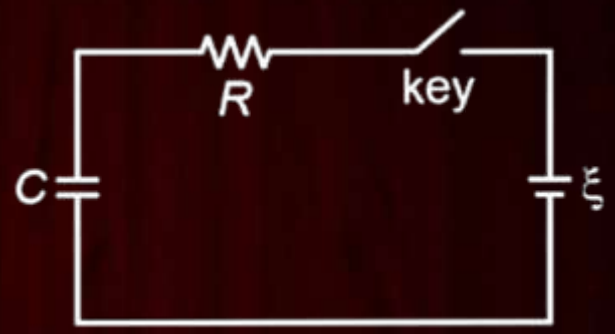
The key shown in the circuit is closed at t = 0.

Choose the incorrect option regarding the conditions at t = 0



A

Current in the circuit is zero

B

Voltage across the capacitor is minimum

C

Current in the circuit is maximum

D

Voltage across resistance is maximum

Self-inductance depends on

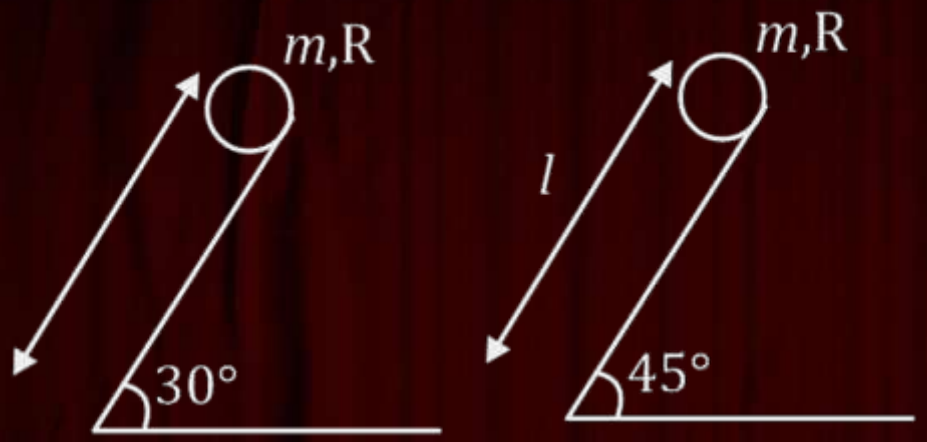
A. Only on geometry

B. Only on medium property

C. Geometry and medium property

D. Value of current through inductor

A solid sphere is rolling on an inclined plane as given below. Find the ratio of $V_1 : V_2$ when sphere reaches at bottom of the inclined plane



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Find the equation of magnetic field for the give equation of electric field (for EM wave).

$E = E_0(4\hat{t} - 3\hat{j})\cos(\omega t - kz)$

A $\vec{B} = \frac{E_0}{c}(3\hat{i} + 4\hat{j})\cos(\omega t - kz)$

B $\vec{B} = \frac{E_0}{c}(-3\hat{i} - 4\hat{j})\cos(\omega t - kz)$

C $\vec{B} = \frac{E_0}{c}(3\hat{i} - 4\hat{j})\sin(\omega t - kz)$

D $\vec{B} = \frac{E_0}{c}(-3\hat{i} - 4\hat{j})\sin(\omega t - kz)$

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A bullet at 300 K hits a wooden block. The melting point is 600 K, and the total work done is 500 J. If the specific heat capacity is 0.442 J/g. °C and the latent heat is 247 J/g. Find the mass of the bullet.

A

1.32 g

B

0.50 g

C

2.50 g

D

3.00 g

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A force $\vec{F} = x^2y\hat{\imath} + y^2\hat{\jmath}$ is acting on a body and body is moved from (0,0) to (4, 2) in a plane x + y = 10. Find work done by this force.

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Given a convex lense of refractive index μ_2 in a liquid of refractive index μ_1, $\mu_1 < \mu_2$ having radii of curvature R_1, R_2 and R_3 surface a silver polished. Where should an object be placed on the optic axis so that the real and inverted image is formed a the same place.

A $\frac{(\mu_2+\mu_1)|R_1|}{(\mu_2-\mu_1)}$

B $\frac{\mu_1|R_1|\cdot|R_2|}{\mu_2(|R_1|+|R_1|-\mu_1|R_2|}$

C $\frac{\mu_1|R_1||R_2|}{\mu_2(2|R_1|+|R_2|)-\mu_1\sqrt{|R_1|\cdot R_2|}}$

D $\frac{\mu_1|R_1|\cdot|R_2|}{\mu_2(|R_1|+|R_2|)-\mu_1|R_1|)}$