PAPER SOLUTION

From Meerut

JEE MAIN

2025

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23	1st

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JEE MAIN 2025 LIVE PAPER DISCUSSION

#Q. Electric flux ϕ is related with linear charge density λ and surface charge density σ as as $\phi = \alpha\lambda + \beta\sigma$, where α and β are of appropriate dimensions of (β/α) is :

A Displacement

B Area

C Electric field

D Velocity

Ans. (A)

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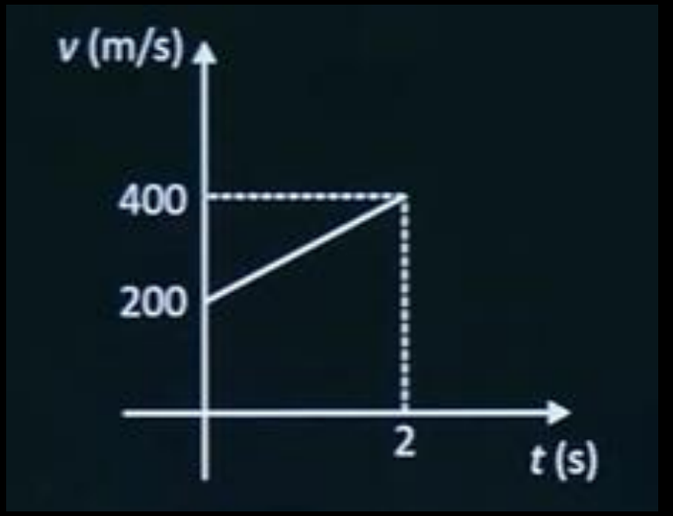
#Q. For given velocity-time (v-t) graph, find distance travelled at 0.5 sec :



(A) 125 m

(B) 112.5

(C) 137.m

(D) 150m

Ans. (B)

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#Q. The displacement of a particle as function of time is $x(t) = A(\sin) + B\cos^2(t) + ct^2 + D$. Find dimension of $\left[\frac{ABC}{D}\right]$

A L^2

B L^2T^{-2}

C Lt^{-2}

D L^3T

Ans. (B)

#Q. The ratio of electric force to gravitational force between two particles having charge 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 $\frac{q_1 q_2}{4\pi\varepsilon_0 G m_1 m_2}$

Ans. (D)

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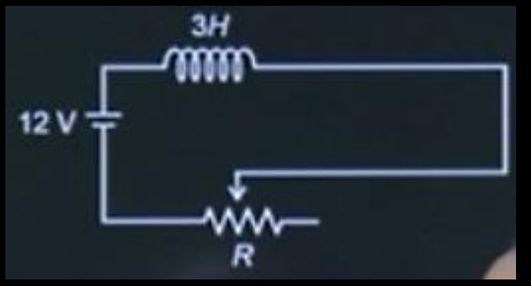
#Q. In given DC circuit, find current for R = 12 Ω in steady state.



A 2 A

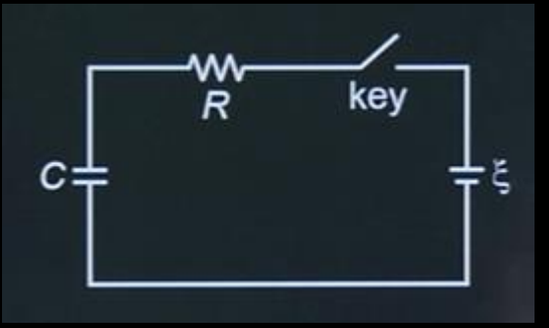
B 1 A

C 3 A

D 4 A

Ans. (B)

#Q. 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

Ans. (A)

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#Q. Match the column appropriately regarding thermodynamic process.

	Column I		Column II
(P)	When volume change is zero	(i)	$\Delta W = 0$
(Q)	When volume is constant	(ii)	$\Delta Q = 0$
(R)	When no heat is exchanged	(iii)	Isobaric
(S)	Work done by the gas is equal to heat given to the gas	(iv)	Isothermal

A. P(iv), Q(iii), R(i), S(ii)

B. P(i), Q(iii), R(ii), S(iv)

C. P(ii), Q(iii), R(iv), S(i0

D. P(ii), Q(iii), R(i), S(iv)

Ans. (B)

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#Q. Self-inductance depends on

A. Only on geometry

B. Only on medium property

C. Geometry and medium property

D. Value of current through inductor

Ans. (C)

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#Q. Solid sphere of mass m rolls dawn rest to achieve speed v_1 an inclined plane of 30°. Sphere achieves speed v_2 an inclined plane of 45° when released from same height the $\frac{v_1^2}{v_2^2}$ is (Assume no slipping)

A. 1

B. $\frac{5}{2}$

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

D. $\frac{\sqrt{3}}{\sqrt{2}}$

Ans. (A)

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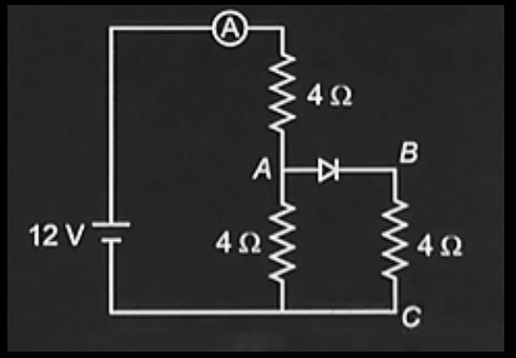
#Q. For the circuit shown below
(A) Current in ammeter is 2 A
(B) Net resistance is 8 Ω
(C) Voltage across BC is 4 V
(D) Current the correct option.



A Only A, B, C are correct

B Only A, C, D are correct

C Only A, D are correct

D Only A, d are current

Ans. (B)

#Q. Find the time period of a cube of side length 10 cm and mass 10 g oscillating in water. (Density of water = 10^3 kg/m^3 and g = 10 m/s^2)

A $\frac{\pi}{25}$ second

B $\frac{\pi}{50}$ second

C $\frac{\pi}{100}$ second

D $\frac{2\pi}{25}$ second

Ans. (B)

#Q. Adiabatic constant of a gas is $\frac{3}{2}$. If volume of gas initially at 0ºC is reduced to one fourth of the original volume then new temperature is :

(A) 0 K

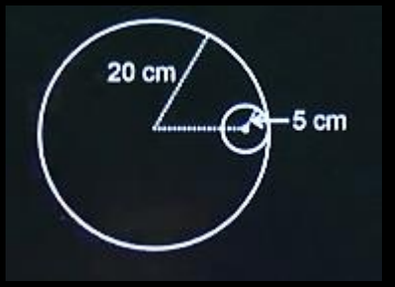
(B) 273 K

(C) 546ºC

(D) 546 K

Ans. (D)

#Q. From a uniform circular disc of radius 20 cm a circular portion of radius 5 cm is removed. The shift in the position of centre of mass (in cm).



Ans. 1

#Q. A bullet of kinetic energy of 125 J strikes a lead block where temperature rises by 50ºC. If specific heat of lead is 0.1 J/gºC then mass of lead block is (Assume half of kinetic energy of bullet is converted to heat) m gram then 2 m is :

Ans. 25

#Q. There is force field $\vec{F} = x^3y^2\hat{\imath} + y^2\hat{\jmath}$ in which a particle moves along the line x = y. Find work done by the force as the particle moves from (0, 0) to (2, 2)

A 173/15

B 136/15

C 139/17

D 171/17

Ans. (B)

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#Q. In a radioactive decay, decay constant of element A_2 is 3 times that of element A_1. Find the ratio of nuclei of element 1 to element 2 after one half life of A_2.
(Assume initial number of nuclei are same for both elements)

A $2^{1/3}$

B $2^{2/3}$

C 2

D $2^{5/3}$

Ans. (B)

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#Q. What is the dimensional formula of torsional constant K.

A $[ML^2T^{-2}]$

B $[ML^4T^{-2}]$

C $[ML^3T^{-2}]$

D $[ML^1T^{-2}]$

Ans. (A)

#Q. Statement –I : Hot water is less viscous than of cold water.
Statement-II : Surface tension of soap solution is more than that of pure water.

(A) Statement-I is true and statement-II true

(B) Statement-I is true and statement-II false

(C) Statement-I is false and statement-II false

(D) Statement-I is false and statement-II true

Ans. (B)

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#Q. Two particles are located at equal distance from origin. The position vectors of those are represented by $\vec{A} = 2\hat{\imath} - 3n\hat{\jmath} + 2\hat{k}$ and $\vec{B} = 2\hat{\imath} - 2\hat{\jmath} + 4p\hat{k}$ respective. If both the vectors are at right angle to each other, the value of n^{-1} is.

(A) 1

(B) 3

(C) 2

(D) 4

Ans. (B)