PAPER SOLUTION

From Meerut

JEE MAIN

2025

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22	1st

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JEE MAIN 2025 LIVE PAPER DISCUSSION

#Q. Write dimensional formula of $\frac{B}{\mu_0}$. Where B = magnetic field and μ_0 = magnetic permeability.

A $[AL^{-1}]$

B $[AL]$

C $[MALT]$

D $[MALT^{-1}]$

Ans. (A)

#Q. Solid sphere of mass M, radius R exerts force F on a point mass. Now a concentric spherical mass $\frac{M}{7}$ is removed. What is new force ?

A $\frac{F}{7}$

B $\frac{6}{7}F$

C $\frac{5F}{7}$

D $\frac{3F}{7}$

Ans. (B)

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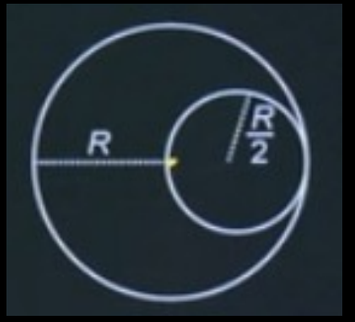
#Q. From a disc of M and radius R, a cavity of radius $\frac{R}{2}$ is created. Find the moment of inertia about an axis passing through the centre of disc.



A $\frac{31}{40}MR^2$

B $\frac{31}{80}MR^2$

C $\frac{13}{32}MR^2$

D $\frac{21}{32}MR^2$

Ans. (C)

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#Q. Statement I – In a vernier calipers, one vernier scale division is smaller than one main scale division.

Statement II– The vernier constant is given by one main scale division multiplied by the number of vernier scale division.

(A) Statement – I and Statement – II both are correct

(B) Statement – I and Statement – II both are incorrect

(C) Statement – I correct Statement – II is incorrect

(D) Statement – I incorrect Statement – II is correct

Ans. (B)

#Q. Ice at –10°C is to be converted into steam at 110°C. Mass of ice is 10^{-3} kg. What amount of heat is required ?

(A) $\Delta Q = 730$ cal

(B) $\Delta Q = 900$ cal

(C) $\Delta Q = 1210$ cal

(D) $\Delta Q = 870$ cal

Ans. (A)

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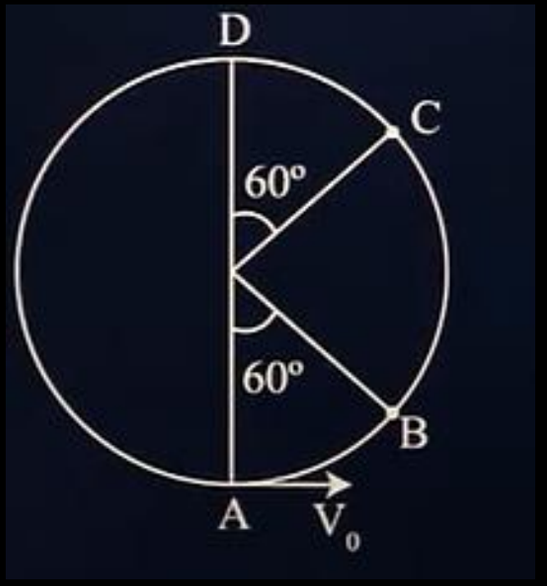
#Q. A bob of mass m is suspended at a point 'O' by a light string of length 'l'. and left to perform vertical motion (circular) as shown in figure. Initially by applying horizontal velocity V_0 at the point 'A', the string becomes slack when the bob reaches at the point 'D'. The ratio of the K.E of the bob at the point B and C is :



(A) 2

(B) 4

(C) 1

(D) 3

Ans. (D)

#Q. Given is a thin convex lens of glass (refractive index μ) and each slope having radius of curvature R. One side is polished for complete reflection. At what distance from the lens, and object be placed an the optic axis so that the image sets formed on the object itself ?

(A) μR

(B) R/(2μ – 3)

(C) R/(2μ – 1)

(D) R/μ

Ans. (B)

#Q. If work function of Cs & Fe is 1.9eV & 2.5 eV. If wavelength of 550 nm is incident which metal will show photoelectric effect

A. Cs & Fe both

B. neither Cs nor Fe

C. Only Cs

D. Only Fe

Ans. (C)

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#Q. An electron is made to enter symmetrically b/w two parallel and equal oppositely charged metal plates, each of 10 cm length. The electron emerges out of the electric field region with a horizontal component of velocity 10^6 m/s. If the magnitude of the electric field between the plates is 9.1 V/cm, then the vertical component of velocity of electron is (mass of electron = 9.1×10^{-31} kg, and charged of electron = 1.6×10^{-19}C).

A 0

B 16×10^6 m/s

C 16×10^4 m/s

D 1×10^6 m/s

Ans. (B)

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#Q. Statement-I : If young's double site experiment is performed in an optically denser medium than air, then the consecutive fringes come closer.

Statement-II : The speed of light reduces in an optically denser medium than air while its frequency does not change.

A Statement – I and Statement – II both are correct

B Statement – I and Statement – II both are incorrect

C Statement – I correct Statement – II is incorrect

D Statement – I incorrect Statement – II is correct

Ans. (A)

#Q. A closed organ and an open organ tube are filled by two different gases having same bulk modulus but different densities ρ_1 and ρ_2, respectively. The frequency of 9^{th} harmonic of closed tube is identical with 4^{th} harmonic of open tube. If the length of the closed tube is 10 cm and the density ratio of the gasses if $\rho_1 : \rho_2 = 1 : 16$, then the length of the open tube is :

A $\frac{15}{7}$ cm

B $\frac{20}{7}$ cm

C $\frac{15}{9}$ cm

D $\frac{20}{9}$ cm

Ans. (D)

#Q. A capacitor is charged by battery to charge Q_1. Now the battery is disconnected and dielectric slab of dielectric constant k is inserted between the gaps of the plates. Now charge on capacitor is Q_2. Find $\frac{Q_1}{Q_2}$.

A 1

B ½

C 2

D 2/3

Ans. (A)

#Q. A of charge q is placed at mid of the edge of an imaginary cube of side ‘a’. find the net flux passing through the cube..

A $\frac{q}{4\varepsilon_0}$

B $\frac{q}{8\varepsilon_0}$

C $\frac{q}{6\varepsilon_0}$

D $\frac{q}{2\varepsilon_0}$

Ans. (A)

#Q. Identify the diode connected in forward bias -

A 

B 

C 

D 

Ans. (C)

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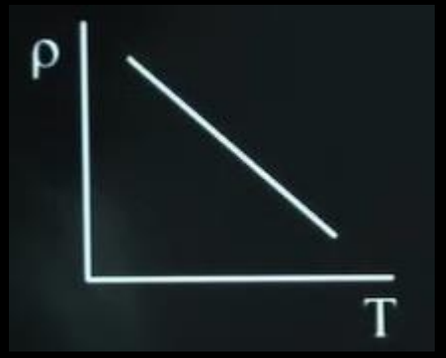
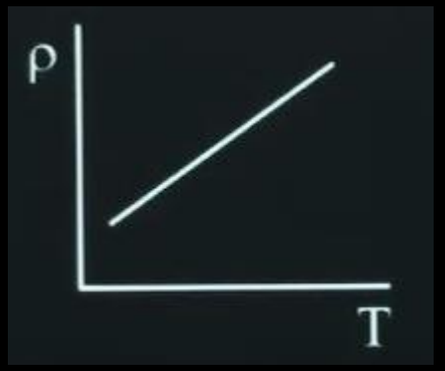
#Q. Identify the correct graph between resistivity and temperature for a conductor.

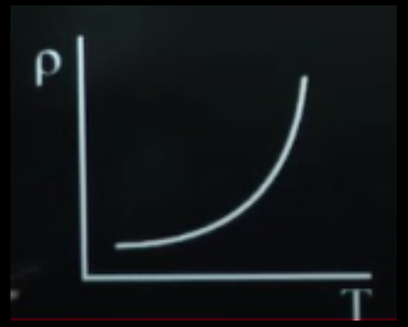
A



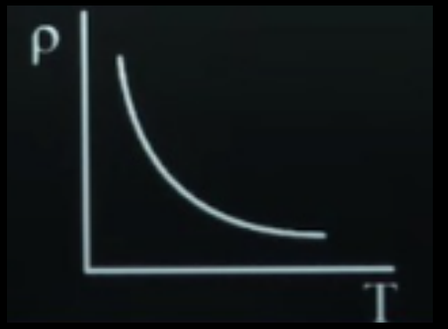
B



C



D



Ans. (C)

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#Q. A particle is projected with velocity 60 m/s at an angle 30° with respect to horizontal. It reaches height h_1 in 1st second and height h_2 in last second during its motion ratio of h_1/h_2.

(A) 1

(B) 4

(C) 2

(D) 2/3

Ans. (A)

#Q. Two spherical black bodies of radius 0.8 m and 0.2 m are at temperatures of 400 K and 800 K respectively. Find ratio of rate of heat loss.

A 8

B 2

C 4

D 1

Ans. (D)

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#Q. Two batteries are connected in parallel
Statement-1 : Net emf is less then the emf of any one of them.
Statement-2 : Net internal resistance is less then individual resistance.

(A) Statement-1 is true and Statement-2 is false

(B) Statement-1 is false and Statement-2 is true

(C) Both Statement are true

(D) Both Statement are false

Ans. (B)

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#Q. A parallel plate capacitor of capacitance 40μF is connected to a 100 V power supply now the intermediate space between the plates is filled with a dielectric material of dielectric constant k = 2. Due to the introduction dielectric the extra charge and the change in electrostatic energy in the capacitor respectively or

A 2 μC and 0.5 J

B 2 μC and 0.2 J

C 4 μC and 0.5 J

D 8 μC and 0.4 J

Ans. (D)

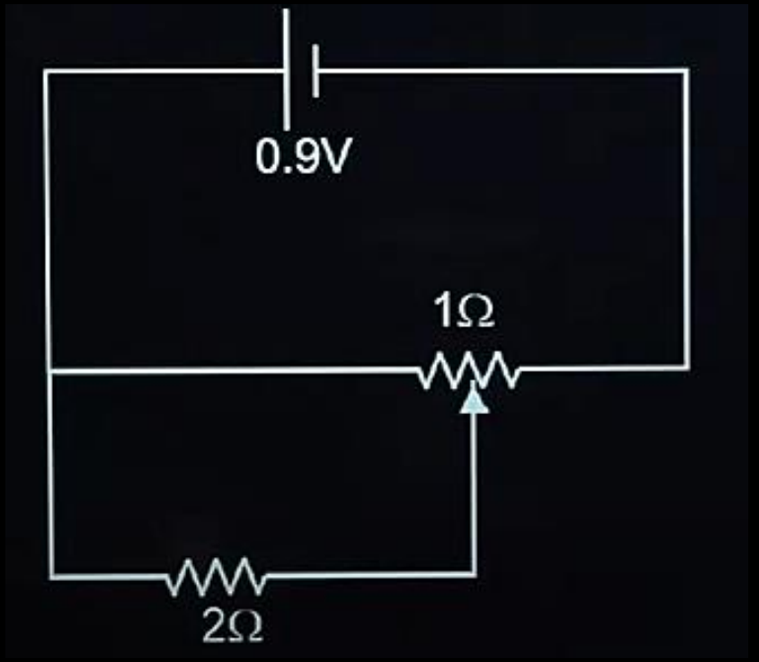
#Q. Two soap bubbles of radius 2 cm and 4 cm coalesce then find radius of common surface.

Ans. (4)

#Q. A body of mas M at rest explodes into three pieces, in the ratio of masses 1 : 1: 2. Two smaller pieces fly off perpendicular to each other with velocities of 30m/s and 40 m/s respectively. The velocity of the third piece will be :

Ans. (25)

#Q. Find current in the circuit. Jockey is at middle point on 1Ω .



Ans. (1)