

JEE Main – 07th April – 2025 (Shift-1)

[Memory Based Questions]

PHYSICS

1. In a resonance tube closed at one end. Resonance is obtained at length $l_1 = 120$ cm and $l_2 = 200$ cm. If $V_s = 340$ m/s. Find frequency of sound.

a) 212.5Hz b) 218.4Hz c) 220.5Hz d) 202.5Hz

Ans: (a)

2. 2 plane polarized light waves combine at certain point whose "E" components are

$$E_1 = E_0 \sin \omega t.$$

$$E_2 = E_0 \sin (\omega t + \pi/3)$$

Find the Amplitude of Resultant wave.

a) E_0 b) $0.9E_0$ c) $1.7E_0$ d) $3.4E_0$

Ans: (c)

3. AC current is represented by $i = 5\sqrt{2} + 10 \cos \left(650\pi t + \frac{\pi}{6} \right)$ Amp. The rms value of the current is

a) $5\sqrt{2}$ Amp b) 50 Amp c) 50 Amp d) 10 Amp

Ans: (d)

4. Dimension of $\left[\epsilon_0 \frac{d\phi E}{dt} \right]$ is?

a) L^2A b) A c) A^{-1} d) $L^{-1}A$

Ans: (b)

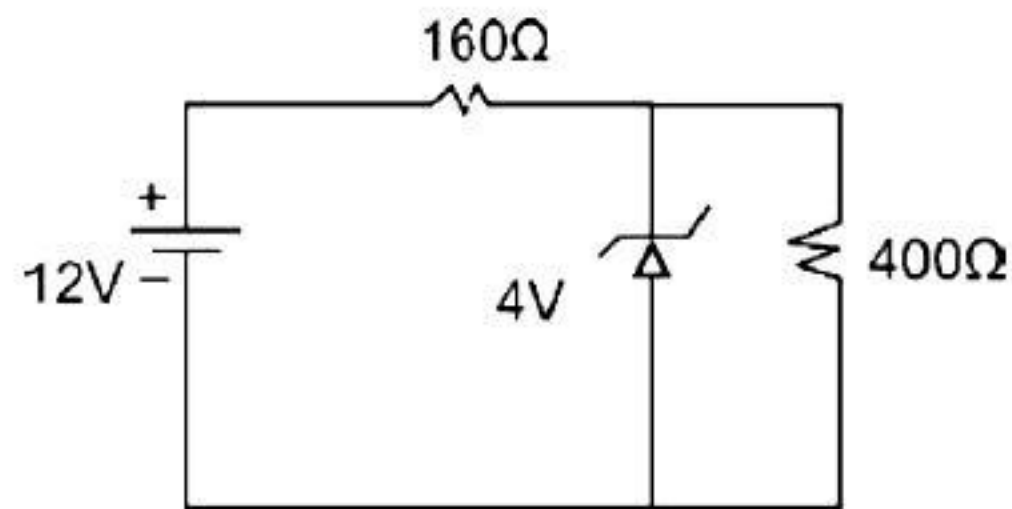
5. A lens having refractive index 1.6 has focal length of 12 cm, when it is in air. Find the focal length of the lens when it is placed in water is ____ ($\mu_w = 1.28$)

a) 288 mm b) 655 mm

c) 355 mm d) 555 mm

Ans: (a)

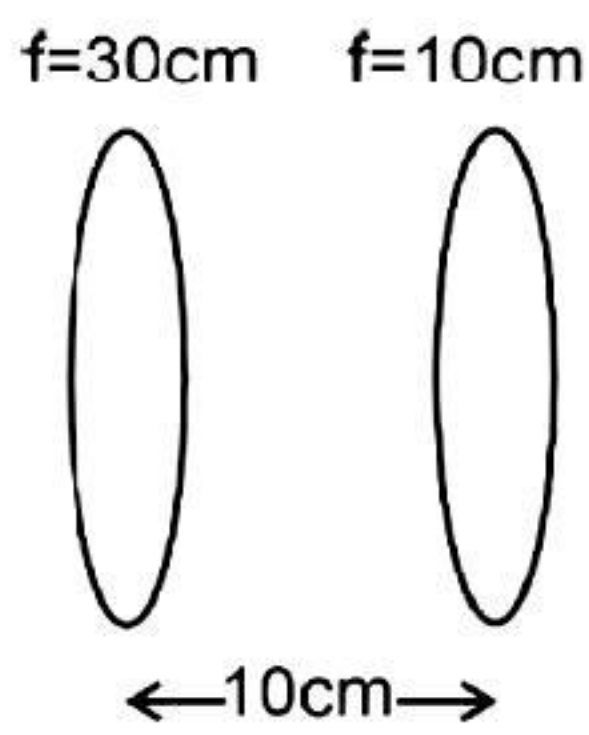
6. Find the current in Zener Diode



- a) 50mA b) 30mA c) 10mA d) 40mA

Ans: (d)

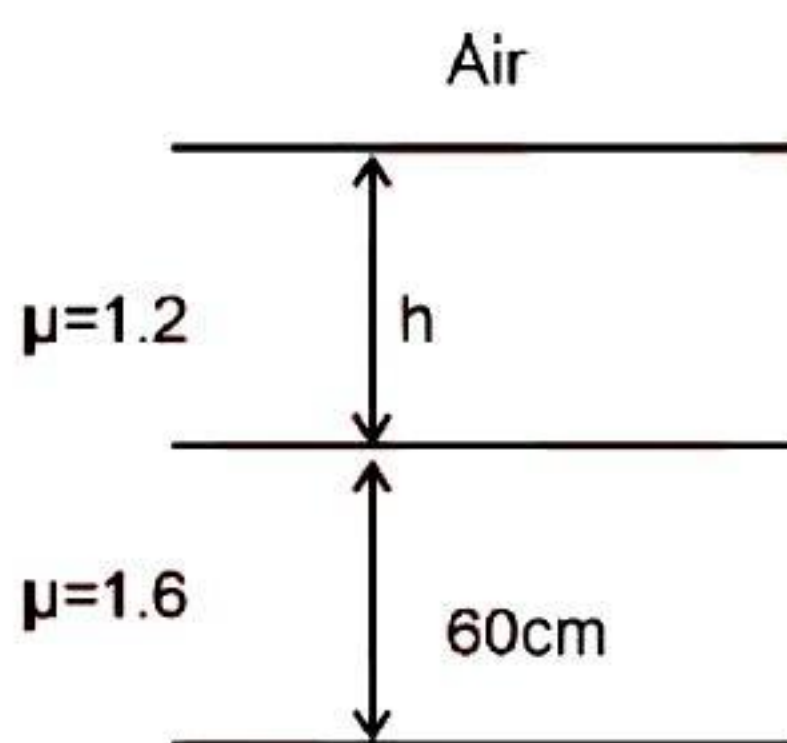
7. Find the power of combination?



- a) 20D b) 5D c) 10D d) 15D

Ans: (c)

8. Find h if apparent depth is 40cm



- a) 5cm b) 3cm c) 7cm d) 9cm

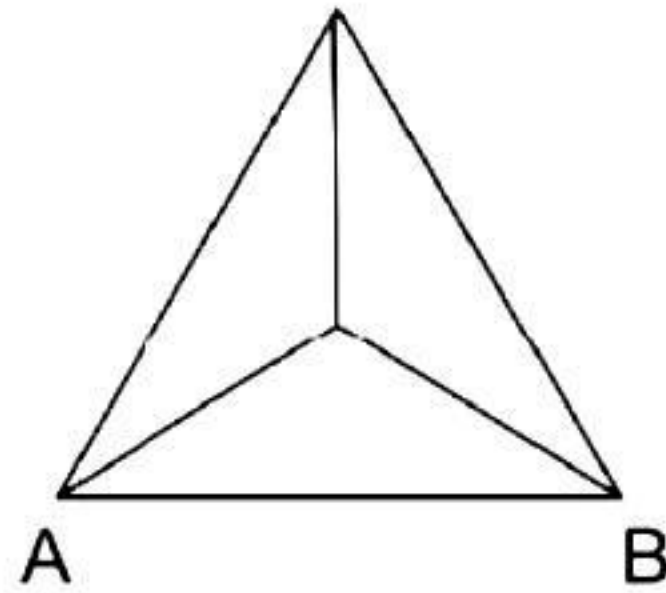
Ans: (b)

9. Two bodies projected with same initial velocities from same point with angles $45 + \alpha$ and $45 - \alpha$. The ratio of their Time of Flights is

- a) 1 b) $\frac{1+\tan \alpha}{1-\tan \alpha}$ c) $\frac{1+\sin 2\alpha}{1-\sin 2\alpha}$ d) $\frac{1-\tan \alpha}{1+\tan \alpha}$

Ans: (b)

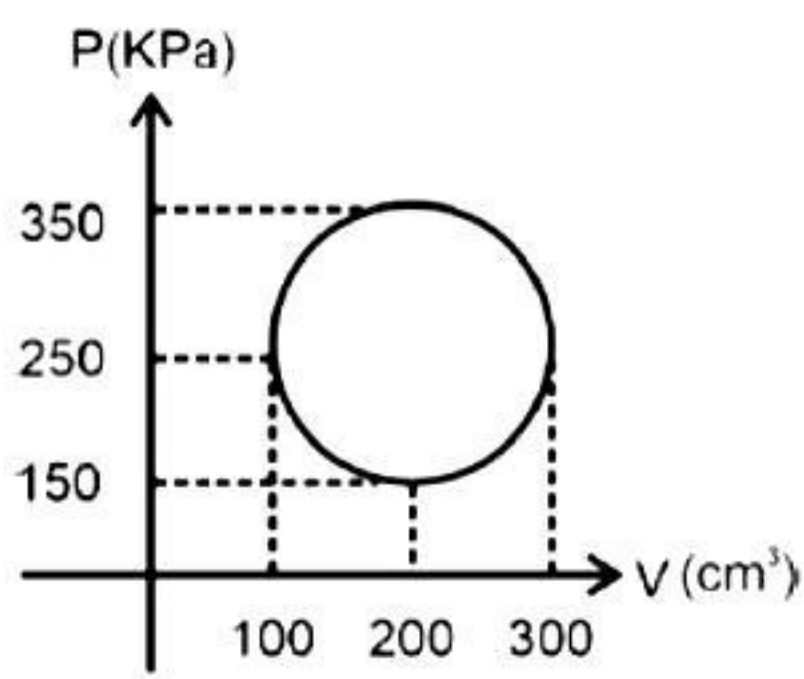
10. A wire of resistance R is made into a pyramid of a triangle. The equivalent resistance b/w A&B is $\frac{R}{n}$. Find ' n '.



- a) 10 b) 14 c) 12 d) 16

Ans: (c)

11. Find the work done



- a) 31.4J b) 21.8J c) 21.4J d) 11.4J

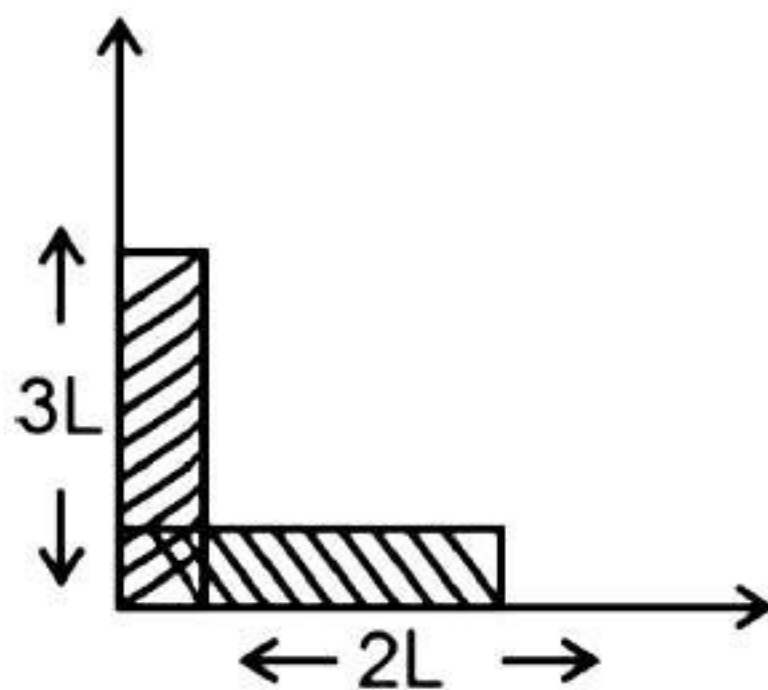
Ans: (a)

12. The percentage increase in magnetic field (B) when space within a current carrying solenoid is filled with magnesium (Given that susceptibility of magnesium is 1.2×10^{-5} at room temp)

- a) $\frac{5}{6} \times 10^{-4}\%$ b) $\frac{5}{3} \times 10^{-5}\%$ c) $\frac{6}{5} \times 10^{-3}\%$ d) $\frac{5}{6} \times 10^{-5}\%$

Ans: (c)

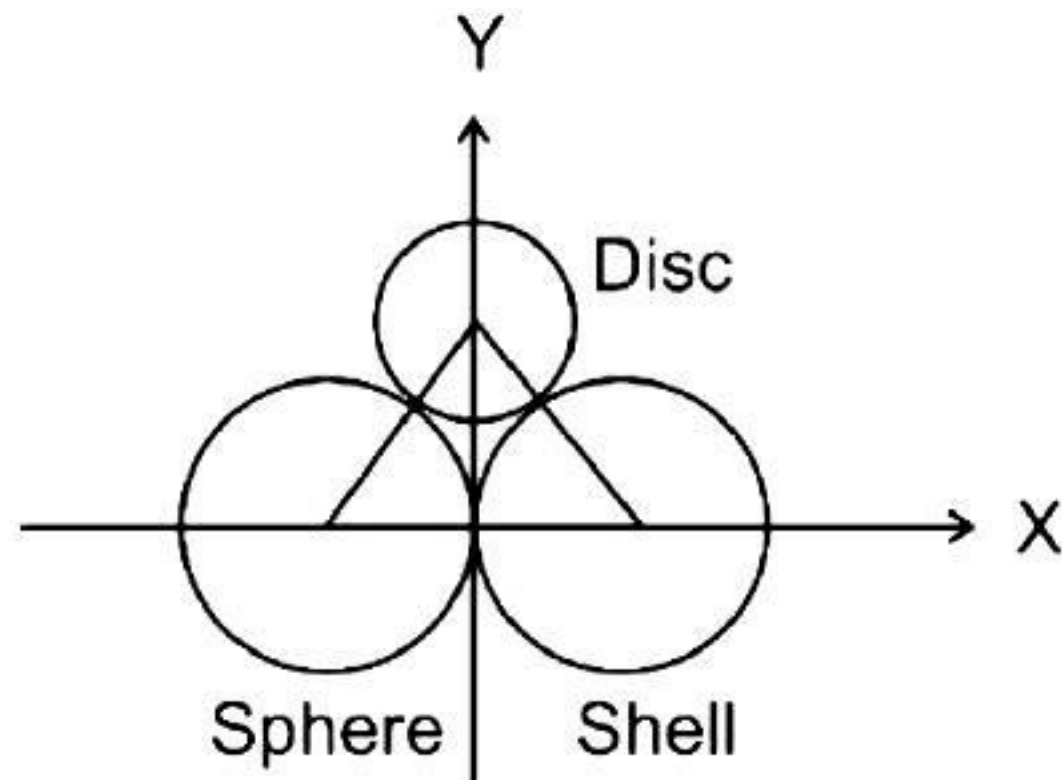
- 13 Where is position of center of mass of the system. ($L = 10$ cm)



- a) $2i + 3j$ b) $4i + 9j$ c) $5i + 8j$ d) $3i + 7j$

Ans: (b)

- 14 Disc, Sphere and spherical shell of same mass and radius are placed as shown. Find moment of inertia about Y-axis



- a) $\frac{199}{60}MR^2$ b) $\frac{189}{60}MR^2$ c) $\frac{179}{60}MR^2$ d) $\frac{159}{60}MR^2$

Ans: (a)

- 15 A composite sound wave is represented by $y = A\cos\omega t + A\cos\omega' t$ the observe beat frequency is

- a) $\frac{\omega - \omega'}{2\pi}$ b) $\frac{\omega' - \omega}{2\pi}$ c) $\frac{\omega t}{\pi}$ d) $\frac{\omega' t}{\pi}$

Ans: (a)

- 16 A cubic block of mass M is sliding down on inclined plane at 60° with an acceleration of $g/2$. The value of coefficient of kinetic friction is

- a) $1 - \frac{\sqrt{3}}{2}$ b) $\sqrt{3} - 1$ c) $\frac{\sqrt{2}}{3}$ d) $\frac{\sqrt{3}}{2}$

Ans: (b)