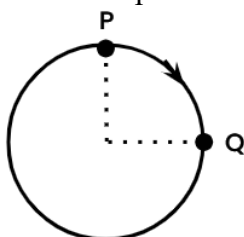


**JEE-Main-04-04-2024 (Memory Based)**  
**[EVENING SHIFT]**

**Physics**

Question: A particle covers  $90^\circ$  along the circumference of a circle of radius 2 km as shown find its displacement.



Options:

- (a) 2 km
- (b)  $\pi$  km
- (c)  $2\sqrt{2}$  km
- (d) 4 km

Answer: (c)

Question: 2 wires A and B are made of same material and have same mass. Radius of A is 2 mm and B is 4 mm. If resistance of B is  $2 \Omega$ , resistance of A is

Options:

- (a)  $4 \Omega$
- (b)  $8 \Omega$
- (c)  $16 \Omega$
- (d)  $32 \Omega$

Answer: (c)

Question: In a system of 3 kg and 2 kg, 3 kg is moved by 2 units towards COM. How much should 2 kg move so that COM does not change position.

Options:

- (a)  $4/3$  units
- (b)  $5/3$  units
- (c)  $7/3$  units
- (d)  $7/5$  units

Answer: (a)

Question: A satellite revolves around the earth. The distance of the satellite at which it should be placed from the earth depends on time period of the earth, mass of the earth and universal gravitational constant

$$\{G = [M^{-1} L^3 T^{-2}]\}$$

Find the Relation between distance & Time Period

Options:

- (a)  $R \propto T^3$
- (b)  $R \propto T^{2/3}$
- (c)  $R \propto T^{-3}$

(d)  $R \propto T^{-2/3}$

Answer: (b)

Question: A gas of 1 mole at an initial temperature  $T$  expands adiabatically to double its volume. Find work done ( $\gamma = 3/2$ )

Options:

(a)  $RT(2-\sqrt{2})$

(b)  $2RT$

(c)  $RT/2$

(d)  $3RT$

Answer: (a)

Question: A bar magnet has a magnetic moment of  $0.5 \text{ Am}^2$  and it is placed in an external magnetic field of  $8 \times 10^{-2} \text{ T}$ . Find the work done when it is rotated from most stable position to unstable position

Options:

(a)  $MB$

(b)  $-MB$

(c)  $2 MB$

(d)  $-2 MB$

Answer: (d)

Question: In YDSE, Width of one slit is 4 times the other. Find ratio of maximum intensity to minimum intensity of the interference pattern on the screen

Options:

(a)  $3/1$

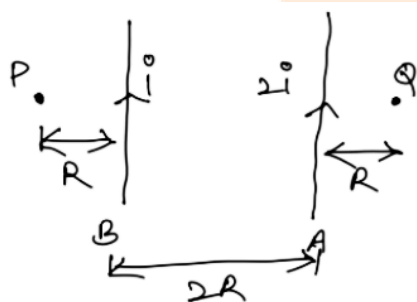
(b)  $9/1$

(c)  $4/1$

(d)  $2/1$

Answer: (b)

Question: Two long wires A and B carry current  $i$  and  $2i$  in the same direction as shown. Ratio of magnetic field at point P, at a distance of  $R$  on the right of B and at point Q, at a distance of  $R$  on the left of A, is  $x/7$  then find  $x$



Options:

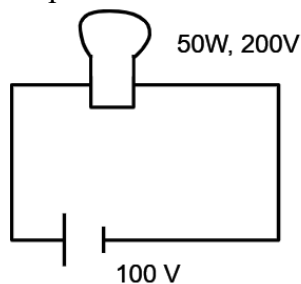
Answer: (5)

Question: A capacitor of capacitance  $12.5 \text{ pF}$  was charged by a voltage battery of  $12 \text{ V}$ . Then the battery is removed and a dielectric of dielectric constant  $6$  is introduced between the plates of the capacitors find the change in potential energy.

Options:

- (a) 775 pJ
  - (b) -775 pJ
  - (c) 900 pJ
  - (d) -900 pJ
- Answer: (b)

Question: A bulb rated 50W, 200V is connected to a battery of 100V. Find the power dissipated.



- Options:
- (a) 50W
  - (b) 25W
  - (c) 12.5W
  - (d) 6.25W
- Answer: (c)

Question: Statement-1: Contact angle between liquid and solid depends on nature of the solid  
Statement-2: Rise of a liquid in a capillary tube is independent of its inner radius

- Options:
- (a) Only statement 1 is correct
  - (b) Only statement 2 is correct
  - (c) Both are correct
  - (d) Both are incorrect
- Answer: (a)

Question: A glass slab of refractive index  $\sqrt{2}$  and thickness 3cm. Glass is incident by a light at an angle equal to the critical angle of glass and air. Find lateral displacement of light ray as it comes out of the glass.

$$\sin 15^\circ = 0.25$$

- Options:
- (a)  $\sqrt{3}$  cm
  - (b)  $\sqrt{3}/2$  cm
  - (c)  $1/\sqrt{2}$  cm
  - (d) 1 cm
- Answer: (b)

Question: A charged particle of charge  $q$  is kept at the centre of the face of a cube. Find the flux linked with the cube

- Options:
- (a)  $\frac{q}{\epsilon_0}$
  - (b)  $\frac{q}{2\epsilon_0}$

- (c)  $\frac{q}{6\epsilon_0}$   
(d)  $\frac{q}{24\epsilon_0}$

Answer: (b)

Question: Moment of momentum of an electron in the 4th orbit is

Options:

- (a)  $\frac{h}{2\pi}$   
(b)  $\frac{h}{4\pi}$   
(c)  $\frac{2h}{\pi}$   
(d)  $\frac{h}{\pi}$

Answer: (c)

