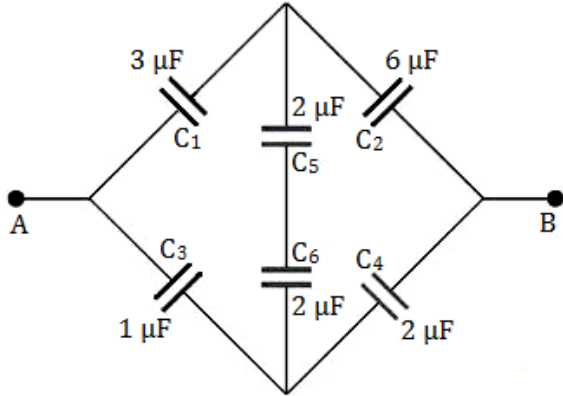


Q.No.

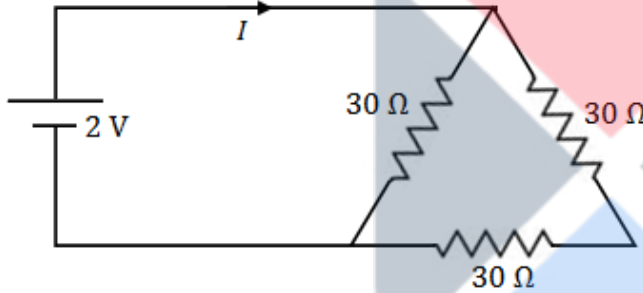
PHYSICS

- A mass m rotates in a vertical circle of radius R and has a circular speed v_c at the top. If the radius of the circle is increased by a factor of 4, circular speed at the top will be
 A) decreased by a factor of 2 B) decreased by a factor of 4 C) increased by a factor of 2 D) increased by a factor of 4
- A vessel contains 1 mol of O_2 and 2 mol of He. What is the value of ' C_p/C_v ' of the mixture?
 A) 17/11 B) 71/65 C) 38/15 D) 46/15
- The effective capacitance between terminals A and B (as shown in the figure) is



- A) 16 μF B) 8 μF C) 6 μF D) 8/3 μF

- The current I in the circuit shown below is



- A) $\frac{1}{45}$ A B) $\frac{1}{15}$ A C) $\frac{1}{10}$ A D) $\frac{1}{5}$ A
- An electric wire in the wall of a building carries a DC current of 25 A vertically upward. What is the magnetic field due to this current at a point which is 10 cm to the right of the wire?
 A) 3.1×10^{-4} T B) 5.0×10^{-5} T C) 4.23×10^{-4} T D) 5.11×10^{-3} T
 - In an electric circuit, R , C , L and AC voltage are all connected in series. When L is removed from the LCR circuit, the phase difference between the voltage and the current in the circuit is $\pi/3$. If instead, C is removed from the LCR circuit, the phase difference is again $\pi/3$. Determine the power factor of the circuit.
 A) $\frac{1}{2}$ B) $\frac{1}{\sqrt{2}}$ C) 1 D) $\frac{\sqrt{3}}{2}$
 - A short object of length l is placed along the principal axis of a concave mirror away from focus. The object distance is x . If the mirror has a focal length f what will be the length of the image? ($l \ll |v - f|$, where v is the image distance)
 A) $\frac{(x-f)^2}{f^2 l}$ B) $\frac{f^2 l}{(x-f)^2}$ C) $\frac{fl}{(x-f)}$ D) $\frac{(x-f)}{fl}$
 - The wavelength of the characteristic X-ray K_α line emitted by a hydrogen like element is 0.32 \AA . The wavelength of K_β line emitted by the same element will be
 A) 0.21 \AA B) 0.27 \AA C) 0.34 \AA D) 0.40 \AA
 - The number of alpha-particles scattered at 60° is 100 per minute in an alpha-scattering experiment on gold foil. The number of alpha-particles scattered per minute at 90° will be
 A) 25 B) 50 C) 16 D) 32
 - A p - n junction diode connected in series with a resistor of 200 Ω is forward biased so that a current of 200 mA flows. If the voltage across this combination is instantaneously reversed at $t = 0$, the current through diode is approximately,
 A) 400 mA B) 200 mA C) 100 mA D) 0 mA