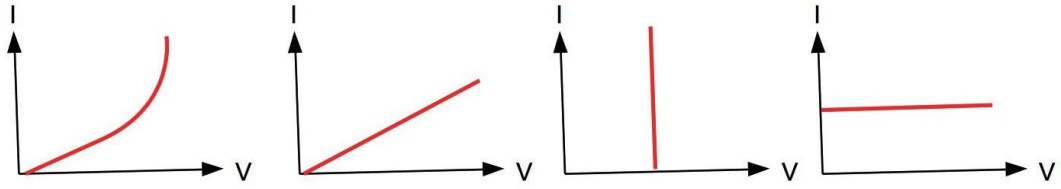
Phys 2212

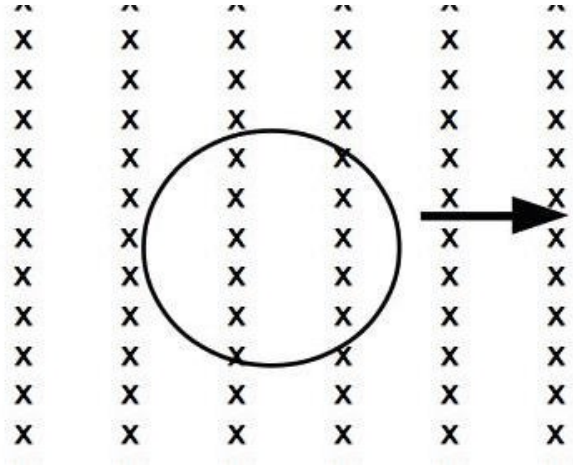
Question 1:
A negatively charged oil drop is suspended in the air using an electric field. The direction of the electric field must be
(a) From left to right
(b) from right to left
(c) upward
(d) downward

Question 2:
Following diagrams show four different current (I) vs voltage (V) graphs. Which of the following graphs represents an ohmic resistor?



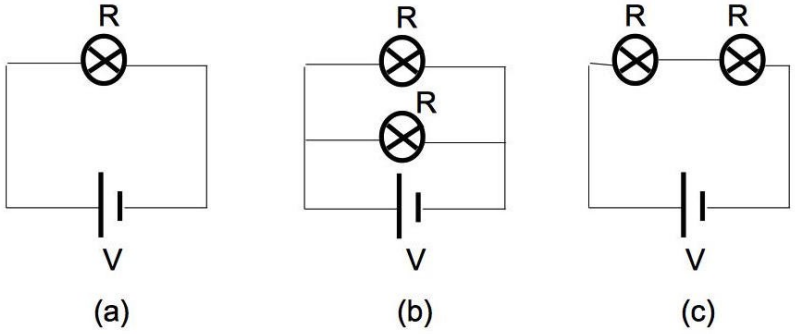
(a) (b) (c) (d)

Question 3:
A wire loop is moving in a uniform magnetic field at a constant speed as shown in the following diagram. The arrow shows the direction of the motion.



The motion does not induce any current in the loop. A possible reason could be
(a) The loop is not moving at an acceleration
(b) The motion of the loop is not in the direction of the magnetic field
(c) There is no change in the magnetic flux in the loop
(d) The loop is too small

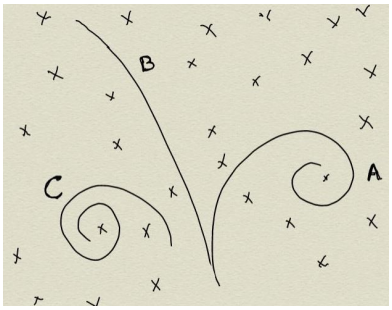
Question 4:
Which following circuits produces the most light output? Assume that the light output is proportional to the total power output of the circuit. The bulbs are identical.



(a) circuit (a)
(b) circuit (b)
(c) circuit (c)
(d) same light output in all three circuits

Question 5:
In a thunderstorm which of the following actions would be the safest?
(a) seek protection under a tree
(b) stay at the top of a hill
(c) stay inside your car
(d) stay in an open space

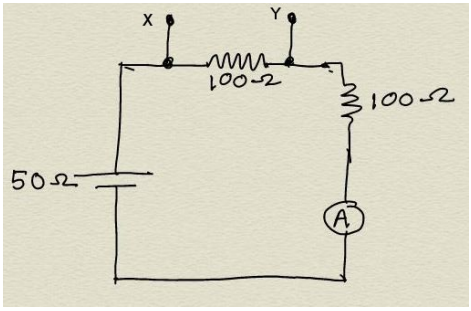
Question 6:



The above picture shows three charged particle tracks in a bubble chamber. The camber is placed in a uniform magnetic field which is pointed into the plane of the paper. Choose the correct statement from the followings.
(a) A represents a negatively charged particle
(b) B and C represent negatively charged particles
(c) C represents a negatively charged particle
(d) A and C represent negatively charged particles

Question 7:
A series RCL circuit consists of a resistor, a capacitor and an inductor connected in series with R=20Ω, C=100μF and L=120mH. The capacitor and the inductor of an RCL circuit needs to be replaced with a different capacitor and an inductor to double the resonance frequency. Which of the followings will be most suitable capacitor-inductor combination to double the resonance frequency?
(a) C= 50μF, L= 60mH
(b) C= 200μF, L= 30mH
(c) C= 50μF, L= 240mH
(d) C= 200μF, L= 240mH

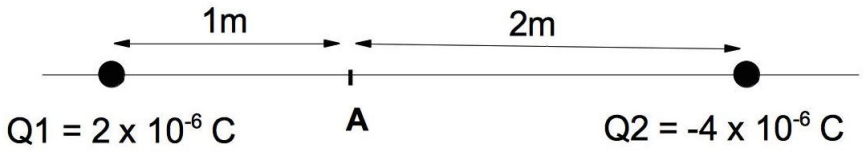
Question 8:
The voltage drop across XY is measured using a voltmeter with a finite internal resistance.
The internal resistance of the ammeter is negligible. When the voltmeter is connected across XY



(a) the voltage across XY and the current in the ammeter decreases
(b) the voltage across XY increases but the current in the ammeter decreases
(c) the voltage across XY and the current in the ammeter increases
(d) the voltage across XY decreases but the current in the ammeter increases

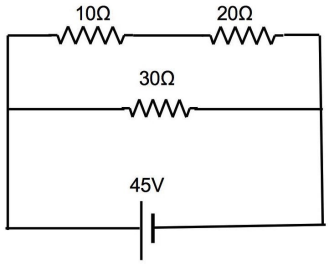
Question 9:
The electrostatic force between two point charges is 2N. If the distance between the charges is doubled, what will be the force between the two charges?
(a) 0.5N
(b) 1N
(c) 2N
(d) 4N

Question 10:
Find the potential at point A due to the two point charges shown in the following diagram.
$\left(k=\frac{1}{4\pi\epsilon_0}=9\times10^9\,N.m^2/C^2\right)$.



(a) 0V
(b) 2000V
(c) 36,000V
(d) 20,000V

Question 11:



Find the current in the 30Ω resistor. Ignore the internal resistance of the battery.
(a) 0.5A
(b) 1.0A
(c) 1.5A
(d) 2.0A

Question 12:
Magnetic flux through a 100 turn coil is given by $\Phi_M = (12\text{V.s})\cos(8t)$. "t" is the time in seconds. Find the maximum induced potential difference across the coil.
(a) 1200V
(b) 800V
(c) 9600V
(d) 150V