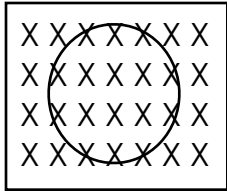
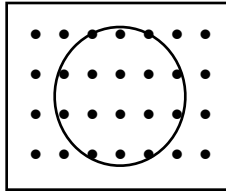


## Exam 2

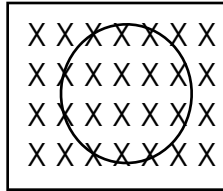
1. Shown below are four different wire loops sitting in uniform magnetic fields. The direction of the fields and how they are changing is indicated for each example. Show with an arrow the direction of the induced current that flows in each wire.



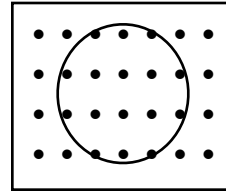
B is decreasing



B is increasing



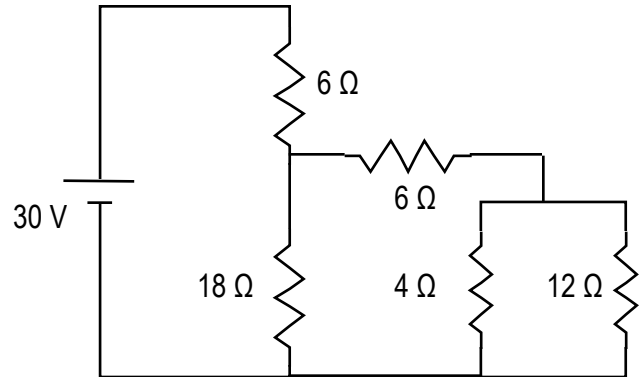
B is increasing



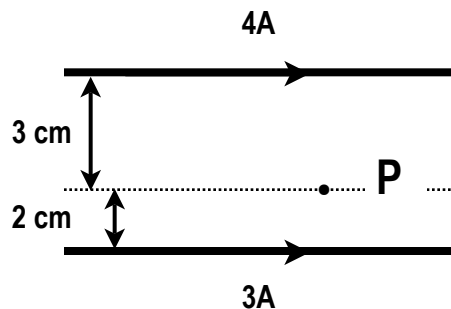
B is decreasing

2. Given the circuit shown, find :

- a. The equivalent resistance of the circuit.
- b. The power supplied by the battery.
- c. The current flowing through the  $18\ \Omega$  resistor.
- d. The power dissipated in the  $4\ \Omega$  resistor.



3. Two long straight wires carry currents as shown. Find the magnetic field (magnitude and direction) at the point P in the diagram.



4. Two positive charges are placed near one another. The charges repel each other with a force of 2N. If the distance between the charges is increased by 12%, what is the new force of repulsion?

5. An electron is placed at a point in space where there is an electric field of 50 N/C directed due east.

- a. Find the magnitude of the electrical force exerted on the electron.
- b. What is the direction of the force exerted on the electron?

6. A  $+3\text{C}$  charge gains electrical energy as it passes through a  $12\text{ V}$  battery.

- a. How much energy does the charge gain?
- b. Where does the energy come from?

7. Electrons in a television set are accelerated through a potential difference of  $30,000\text{ V}$ . Find the final speed of the electrons assuming they start from rest.