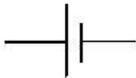
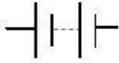
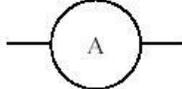
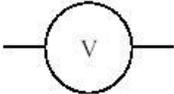
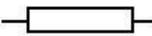
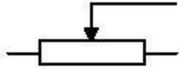
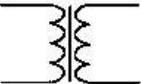
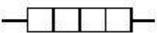


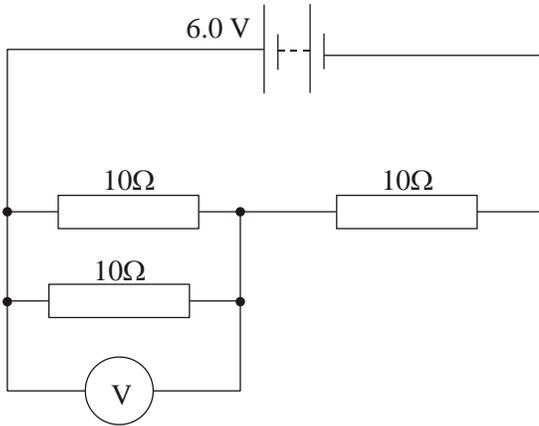
When solving the problems in this set, use this list of IB circuit symbols.

**Electrical Circuit Symbols**

cell		battery	
lamp		ac supply	
switch		ammeter	
voltmeter		galvanometer	
resistor		potentiometer	
transformer		heating element	

- Three resistors,  $5.0\ \Omega$ ,  $10.0\ \Omega$ ,  $15.0\ \Omega$ , are connected in series across a voltage of  $60.0\ \text{V}$ .
  - Draw the circuit diagram.
  - Find the total resistance,  $R_{\text{total}}$ .
  - Find the current in the circuit.
  - Find the potential difference (voltage) across each resistor.
  
- The same resistors from #1 are now connected in parallel.
  - Draw the circuit diagram.
  - Find the total resistance,  $R_{\text{total}}$ .
  - Find the total current in the circuit.
  - Find the current through each resistor.
  
- A  $15.0\ \Omega$  resistor is connected in series to two resistors, a  $20.0\ \Omega$  and a  $10.0\ \Omega$  connected in parallel. The whole circuit is then connected to a voltage of  $60.0\ \text{V}$ .
  - Draw the circuit diagram.
  - Find the total resistance,  $R_{\text{total}}$ .
  - Find the total current in the circuit.
  - Find the current through each resistor.

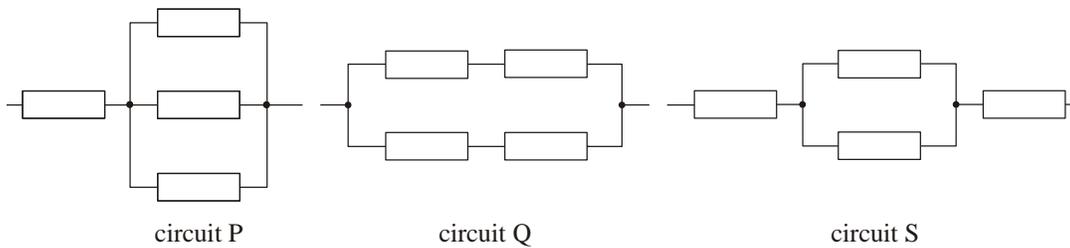
4. In the circuit below the battery has emf 6.0 V and negligible internal resistance. The three resistors each have resistance  $10\ \Omega$ . A high resistance voltmeter is connected as shown.



The reading of the voltmeter is

- (a) 2.0 V.                      (b) 3.0 V.  
(c) 4.0 V.                      (d) 6.0 V.

5. The resistors in each of the circuits shown below each have the same resistance,  $2.0\ \Omega$ .



Which of the following gives the circuits in order of **increasing** total resistance?

- (a) P Q S                      (b) Q P S  
(c) S Q P                      (d) P S Q
6. The work done on a positive point charge of magnitude  $3.0\ \text{nC}$  as it is moved at constant speed from one point to another is  $12\ \text{nJ}$ . The potential difference between the two points is
- (a) 0.0 V   (b) 0.25 V   (c) 4.0 V   (d) 36 V
7. A conductor of constant resistance dissipates  $6.0\ \text{W}$  of power when the potential difference across it is  $12\ \text{V}$ . The power that will be dissipated in this conductor when the potential difference across it is  $24\ \text{V}$  is
- (a) 6.0 W   (b) 12 W   (c) 24 W   (d) 48 W

8. Three resistors, each of resistance  $6.0\ \Omega$ , are connected as shown below. Calculate the total resistance for this arrangement.

