Series and Parallel Circuits

1. State two characteristics of (i) a series circuit and (ii) a parallel circuit.

2. What happens to the total current that flows in a

   (a) series circuit if another load is connected in series with the existing loads?

   (b) parallel circuit if another load is connected in parallel with the existing loads?

3. What effect does the change in current have on the effective resistance of the total circuit in 2 (a) and (b)?

4. Draw a schematic circuit diagram for each of the following:

   (a) Three dry cells are connected in series, which in turn are connected to two light bulbs, a motor, and a switch, also connected in series. A voltmeter is connected to the battery to measure its voltage.

   (b) Two dry cells are connected in series, which in turn are connected to three light bulbs in parallel. A switch can control just one of the light bulbs. An ammeter measures the current of the entire circuit.

5. Design an electric circuit so that an electric motor is controlled by a switch. In addition, one bulb is to remain lit all the time, and another is to be lit only when the motor is operating. Draw the schematic circuit diagram. Construct the circuit to test your circuit design.

6. Try to design a light bulb that could be used in a series circuit so that, if the filament burned out, all other lights would continue to glow.

7. Why are electric circuits in a house wired in parallel with one another?

8. Design a parallel circuit such that one bulb is controlled by a switch while two other bulbs are not and glow continuously. Draw the schematic circuit diagram. Construct the circuit to test your circuit design.