1. Consider the circuit sketched in Figure 4.7, what is the magnitude and direction of electric current .
    (Answer : 0.5A, counterclockwise)
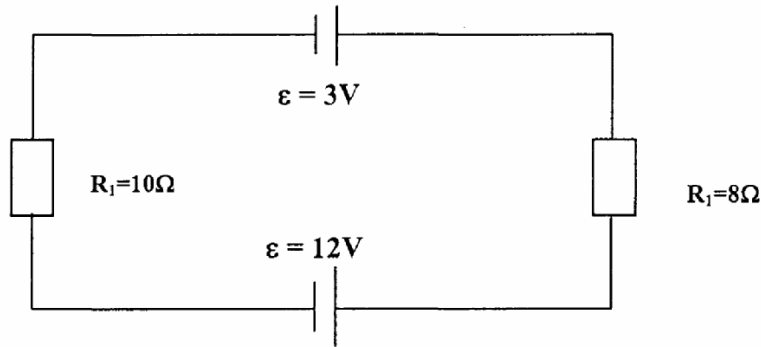

Figure 4.7

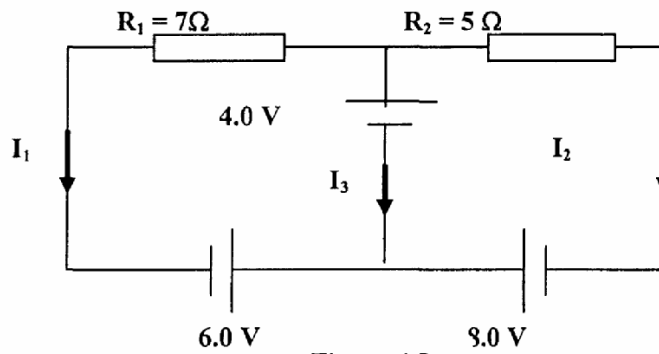2. Find the current in the circuit shown in Figure 4.8

Figure 4.8

(Answer : I_1 = 1.43A, I_2 = 2.4 A, I_3 = - 3.8A)

3. From the figure 4.9 find
    (a) I_1, I_2 and I_3
    (b) Potential at point F if point B was grounded.

(Answer : -1.7A, 2.1A, -0.4A, + 8.4V)
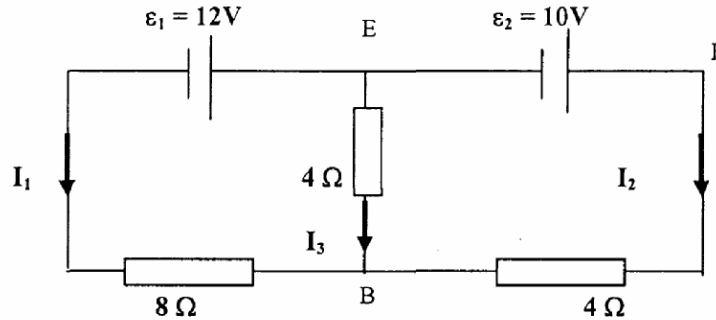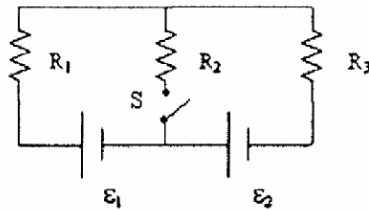

Figure 4.9

Figure 4.10

4   a) In the figure 4.10, if the current through R_1 is 5 A up and if the current through R_3 is 3 A up, what is the current in R_2 if the switch S is closed?

   b) If $R_1 = 6\ \Omega$, $R_2 = 8\ \Omega$, $R_3 = 2\ \Omega$, $\varepsilon_1 = 4$ V, and $\varepsilon_2 = 14$ V and the switch S is closed
      i) what is the current in R_2 ?
      ii) Find the voltage drops across the resistors in the circuit?
      iii) what is the power supplied to the circuit by ε_1?

   c)   If $R_1 = 6.0\ \Omega$, $R_2 = 8.0\ \Omega$, $R_3 = 2.0\ \Omega$, $\varepsilon_1 = 4.0$ V, and $\varepsilon_2 = 14$ V, what is the current flows in the circuit if S is open?

   (Answer a) 8 A, b) i) 1A, ii) V_1= 12V, V_2 = 8 V, V_3 =6V c) 28/8 A)

5.   What shunt resistance should be connected in parallel with an ammeter having a resistance of 0.04Ω so that 25 percent of the total current will pass through the ammeter.
   (Answer : 0.013Ω)

6.   A 36Ω galvanometer is shunted by a resistor of 4.0Ω. What part of the total current will pass through the instrument?
   (Answer : 1/10)

7.   A relay having a resistance of 6Ω operates with a minimum current of 0.03A. It is required that the relay operate when acurrent in the line reaches 0.24A. What resistance should be used to shunt the relay?
   (Answer : 0.86Ω)