Tutorial Questions (for ET1005 PEEE I Chapter 2)

1. Calculate the amount of charge in 50×10^{31} electrons.

2. Determine the number of electrons in 80 µC of electric charge.

3. Calculate the voltage applied if 800 J of energy is required to move 40 C of charge through a resistor.

4. In order to move 2.5 C of charge through a circuit, what is the energy used by a battery of 12 V?

5. Determine the voltage across a resistor with a current of 2 A if it converts 1000 J of electric energy into heat in 15 seconds.

6. Calculate the current in each of the following cases:
   (a) 75 C in 1 s   (b) 10 C in 0.5 s   (c) 5 C in 2 s

7. If 0.6 Coulomb of electric charge is moved in 3 s, what is the current?

8. Determine the time taken to move 10 C of charge if the current is 5 A.

9. If the current is 1.5 A, calculate the electric charge moved in 0.1 s.

10. Calculate the current if 5.74×10^{17} electrons move through a wire in 250 ms.

11. Determine the resistance values and tolerance for the following 4-band resistors:
    (a) red, violet, orange, gold   (b) brown, grey, red, silver

12. Show the placement of an ammeter and a voltmeter to measure the circuit current and the source voltage in Figure 2-13.
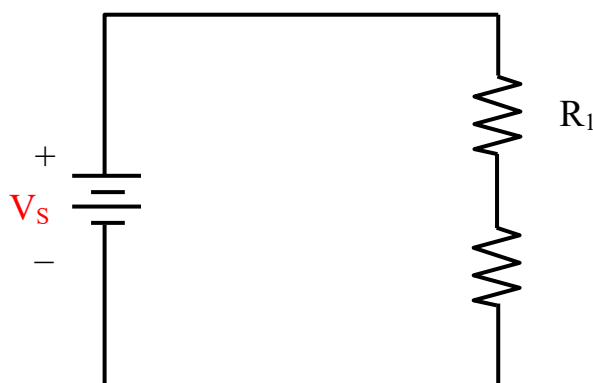

Figure 2-13

13. With reference to Figure 2-13, explain how to measure the resistance of R_2.

14. With reference to Figure 2-14, indicate how to connect an ammeter to measure the current flowing out from the voltage source regardless of the switch position.
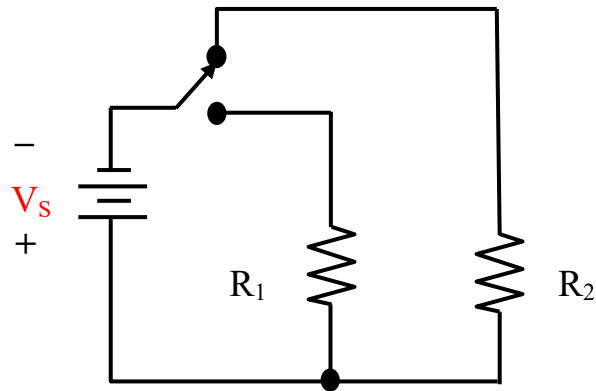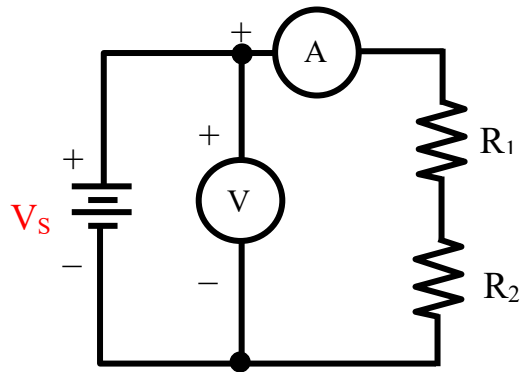

Figure 2-14

Answers

1. 80×10^{12} C

2. 5.0×10^{14} electrons

3. 20 V

4. 30 J

5. 33.3 V

6. (a) 75 A
   (b) 20 A
   (c) 2.5 A

7. 0.2 A

8. 2 s

9. 0.15 C

10. 367 mA

11. (a) 27 kΩ ± 5%
    (b) 1.8 kΩ ± 10%

12.

13. (a) Remove R_2 from the circuit in Figure 2-13.
    (b) Place an ohmmeter in 'parallel' or across R_2.

14.