Sheet (3)

Q1:- True or false

1. A series circuit can have more than one path for current.
2. The total resistance of a series circuit can be less than the largest resistor in that circuit.
3. If two series resistors are different sizes, the larger resistor will have the larger current.
4. If two series resistors are different sizes, the larger resistor will have the larger voltage.
5. If three equal resistors are used in a voltage divider, the voltage across each one will be one-third of the source voltage.
6. Kirchhoff's voltage law is valid only if a loop contains a voltage source.
7. The voltage-divider equation can be written as $V_x = (R_x/R_T)V_S$.
8. The power dissipated by the resistors in a series circuit is the same as the power supplied by the source.
9. If point A in a circuit has a voltage of +10 V and point B has a voltage of −2 V, then V_{AB} is 8 V.

Q2:-Choose the correct answer

1. Five equal-value resistors are connected in series and there is a current of 2 mA into the first resistor. The amount of current out of the second resistor is
   (a) 2 mA   (b) 1 mA   (c) 4 mA   (d) 0.4 mA

2. To measure the current out of the third resistor in a circuit consisting of four series resistors, an ammeter can be placed
   (a) between the third and fourth resistors   (b) between the second and third resistors
   (c) at the positive terminal of the source   (d) at any point in the circuit

3. When a third resistor is connected in series with two series resistors, the total resistance
   (a) remains the same   (b) increases   (c)   decreases   (d) increases by one-third

4. When one of four series resistors is removed from a circuit and the circuit reconnected, the current
   (a) decreases by the amount of current through the removed resistor
   (b) decreases by one-fourth   (c) quadruples   (d) increases

5. A series circuit consists of three resistors with values of 100 Ω, 220 Ω, and 330 Ω. The total resistance is
   (a) less than 100 Ω   (b) the average of the values   (c) 550 Ω   (d) 650 Ω

6. A 9 V battery is connected across a series combination of 68 Ω, 33 Ω, 100 Ω, and 47 Ω resistors. The amount of current is
   (a) 36.3 mA   (b) 27.6 A   (c) 22.3 mA   (d) 363 mA

7. If you measure all the voltage drops and the source voltage in a series circuit and add them together, taking into consideration the polarities, you will get a result equal to
    (a) the source voltage
    (b) the total of the voltage drops
    (c) zero
    (d) the total of the source voltage and the voltage drops

8. There are six resistors in a given series circuit and each resistor has 5 V dropped across it. The source voltage is
    (a) 5 V
    (b) 30 V
    (c) dependent on the resistor values
    (d) dependent on the current

9. A series circuit consists of a 4.7 kΩ, a 5.6 kΩ and a 10 kΩ resistor. The resistor that has the most voltage across it is
    (a) the 4.7 kΩ
    (b) the 5.6 kΩ
    (c) the 10 kΩ
    (d) impossible to determine from the given information

10. Which of the following series combinations dissipates the most power when connected across a 100 V source?
    (a) one resistor   (b) two resistors   (c) three resistors   (d) four resistors

11. The total power in a certain circuit is 1 W. Each of the five equal-value series resistors making up the circuit dissipates
    (a) 1 W   (b) 5 W   (c) 0.5 W   (d) 0.2 W

12. When you connect an ammeter in a series resistive circuit and turn on the source voltage, the meter reads zero. You should check for
    (a) a broken wire   (b) a shorted resistor   (c) an open resistor   (d) both (a) and (c)

13. While checking out a series resistive circuit, you find that the current is higher than it should be. You should look for
    (a) an open circuit   (b) a short   (c) a low resistor value   (d) both (b) and (c)

For the following figure

14. The ammeter reading is zero, the voltmeter 1 and voltmeter 3 readings are zero, and the voltmeter 2 reading is 10 V when

        (a) R_1 is open.

        (b) R_2 is open.

        (c) R_3 is open.

15. The ammeter reading is zero, and all the voltmeter readings are zero when

        (a) A resistor is open.

        (b) The voltage source is turned off or faulty.

        (c) One of the resistor values is too high.

16. The ammeter reading is 2.33 mA, and the voltmeter 2 reading is zero when

        (a) R_1 is shorted.

        (b) The voltage source is set too high.

        (c) R_2 is shorted.

17. The ammeter reading is zero, voltmeter 1 reads 0 V, voltmeter 2 reads 5 V, and voltmeter 3 reads 5 V when

        (a) R_1 is shorted.   (b) R_1 and R_2 are open.   (c) R_2 and R_3 are open.

Q3:-Answer the following questions

1. Determine R_T for each circuit of the following figure. Show how to measure with an ohmmeter.
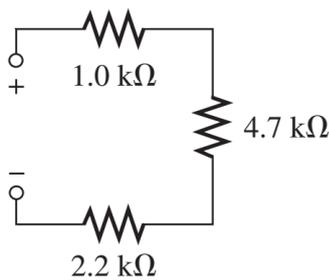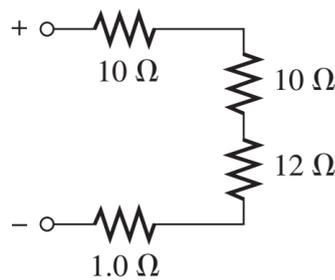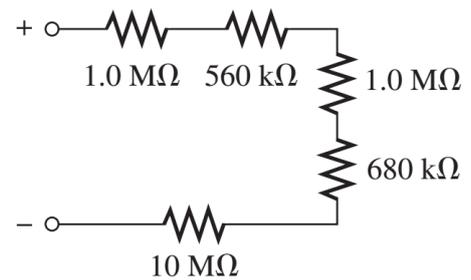
(a)   (b)   (c)

2. What is the current in each circuit of the following figure? Show how to connect an ammeter in each case
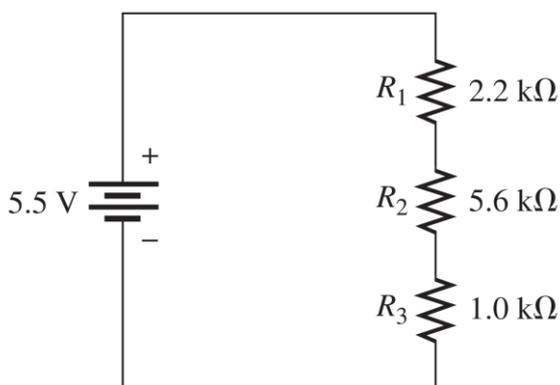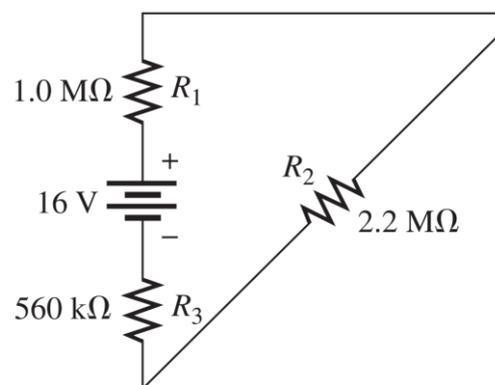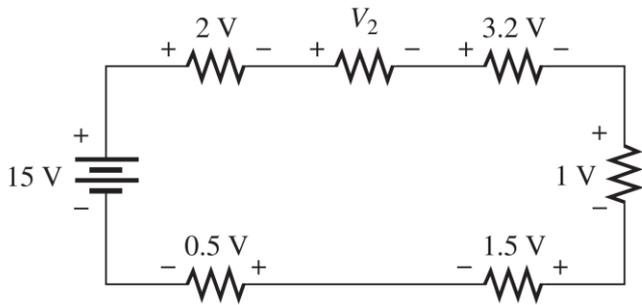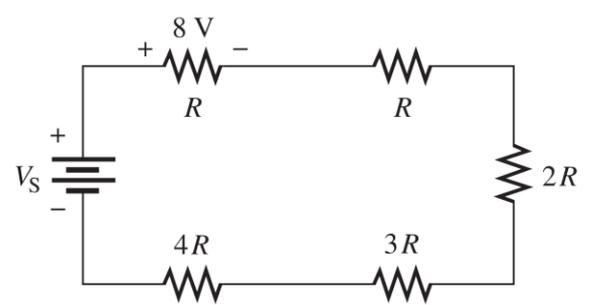

(a)   (b)

3. Determine the unspecified voltage drop(s) in each circuit of the following figure. Show how to connect a voltmeter to measure each unknown voltage drop.
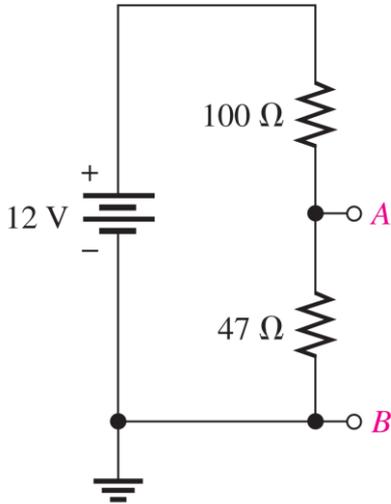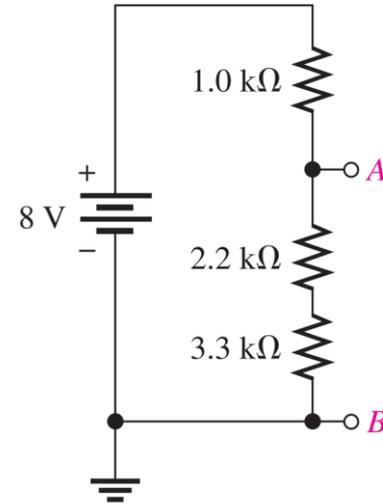

(a)   (b)

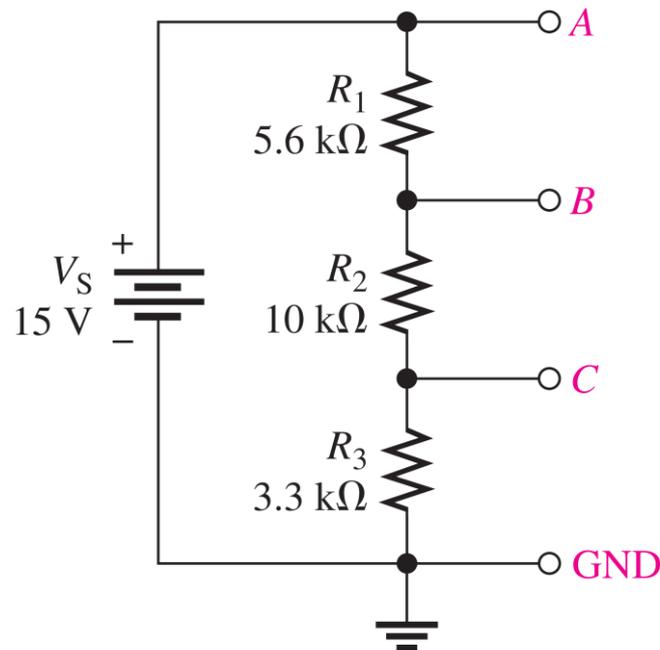4. Find the voltage between A and B in each voltage divider of the following figure.
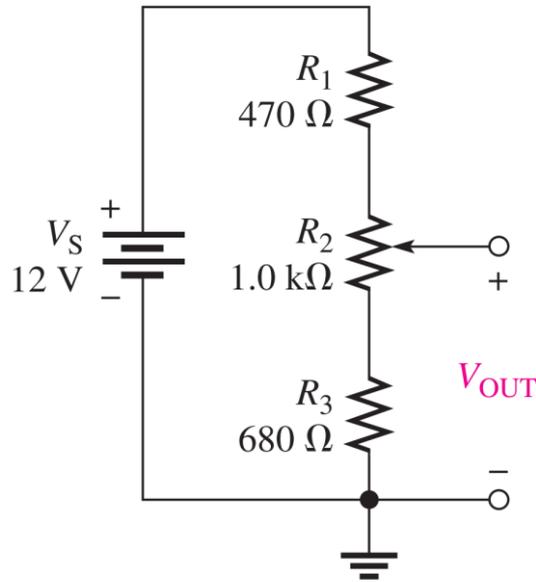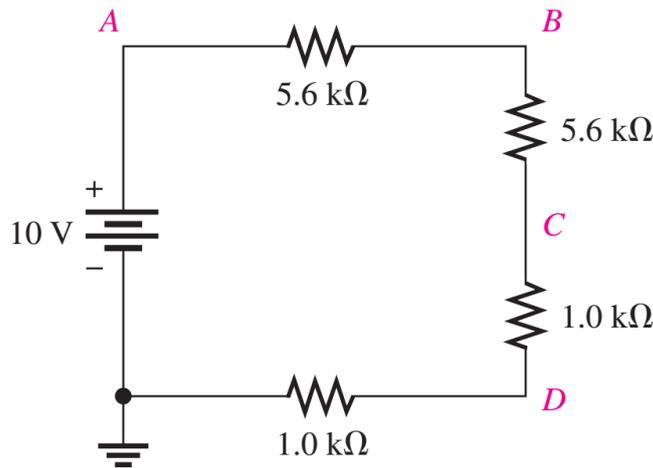

(a)   (b)

5. Determine the voltage with respect to ground for output A, B, and C in the following figure.

6. Determine the minimum and maximum output voltage from the voltage divider in the following figure.

7. Determine the voltage at each point with respect to ground in the following figure.

8. Find all the unknown quantities (shown in red) in the following figure.