ENGG104 Tutorial 3 extra Problems (revision)

Name_____   Student Number_____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.
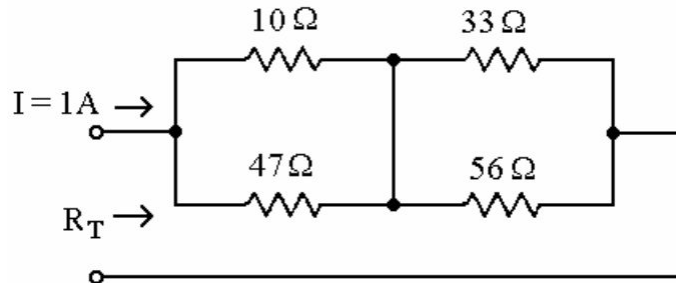

Figure 6.4

1) See Figure 6.4. Compute R_T and the current through the $47\,\Omega$ resistor.   1) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

2) See Figure 6.4. Which two resistors are in parallel?   2) _____
    A) $10\,\Omega$ and $56\,\Omega$ B) $10\,\Omega$ and $33\,\Omega$
    C) $10\,\Omega$ and $47\,\Omega$ D) None are in parallel.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

3) The total power dissipated in a parallel circuit is equal to the _____ of the individual   3) _____
    powers dissipated in the branch circuits.

4) When a branch of a parallel resistance network is replaced by an open circuit, will the total   4) _____
    resistance R_T increase, decrease, or stay the same?

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

5) Two elements, branches, or networks are in series if they have two points in common.   5) _____

6) If there are two resistors in a parallel circuit, total resistance can be calculated by the product   6) _____
    divided by the sum.

7) The total resistance of a parallel resistor network is always more than the value of the smallest   7) _____
    resistor.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

8) Which one of the following statements is true?

8) _____

   A) For minimum measurement error, voltmeters should have low internal resistance and ammeters should have low internal resistance.

   B) For minimum measurement error, voltmeters should have low internal resistance and ammeters should have high internal resistance.

   C) For minimum measurement error, voltmeters should have high internal resistance and ammeters should have high internal resistance.

   D) For minimum measurement error, voltmeters should have high internal resistance and ammeters should have low internal resistance.

9) Kirchhoff's current law states that

9) _____

   A) the sum of the currents entering a junction must equal zero.

   B) the total current entering a given junction is constant, even with changes in supply voltage.

   C) the sum of the currents entering a junction must equal the sum of the currents leaving the junction.

   D) the sum of the currents around a closed loop is zero.

10) What is the total resistance of one thousand 10 kΩ resistors in parallel?

10) _____

   A) 1 Ω B) 10 MΩ C) 10 kΩ D) 10 Ω
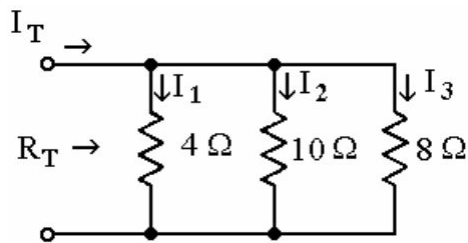

Figure 6.1

11) See Figure 6.1. What is the total resistance R_T?

11) _____

   A) 0.475 Ω B) 0.045 Ω C) 2.11 Ω D) 22 Ω
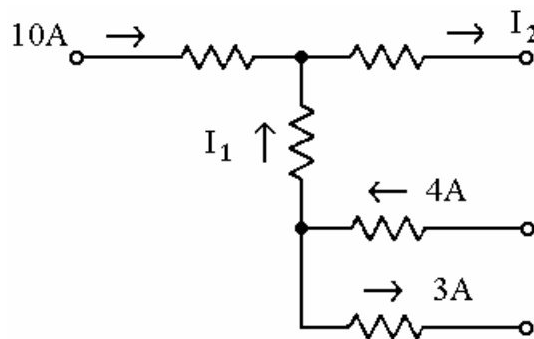

Figure 6.2

12) See Figure 6.2. What is the value of I_2? Use Kirchhoff's current law to determine the answer.

12) _____

   A) 10 A   B) 11 A   C) 9 A   D) 7 A

13) In a parallel circuit, if R_1 = 300 ohms and R_2 = 4.7K ohms the total resistance would be 282 ohms.   13) _____
   What will the total resistance be if the value of R_1 is doubled?
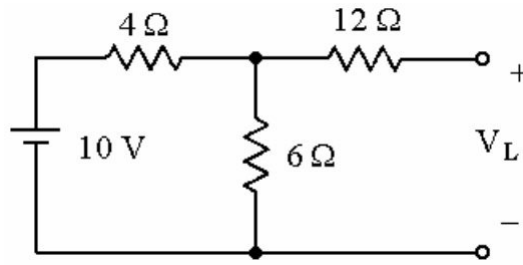   A) 282 ohms   B) 141 ohms   C) 654 ohms   D) 532 ohms

4 Ω   12 Ω
10 V   6 Ω V_L +   −

Figure 6.5

14) See Figure 6.5. What is the new voltage V_L if the 4 Ω resistor is shorted?   14) _____
   A) 10 V   B) 6 V   C) 4 V   D) 8 V

I_T →
↓I_1 ↓I_2 ↓I_3
R_T →   4 Ω   10 Ω   8 Ω
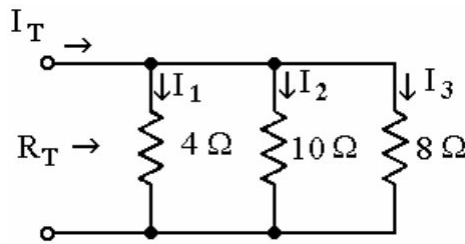
Figure 6.1

15) See Figure 6.1. Use Kirchhoff's current law to compute I_2, given I_T = 100 mA.   15) _____
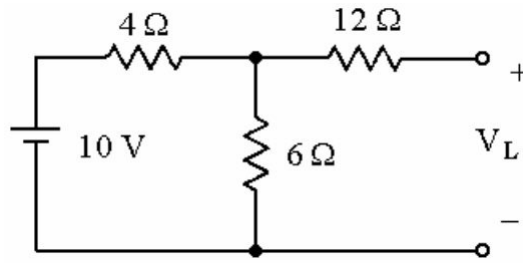   A) 53.7 mA   B) 26.3 mA   C) 100 mA   D) 21.1 mA

4 Ω   12 Ω
10 V   6 Ω V_L +   −

Figure 6.5

16) See Figure 6.5. What is the new voltage V_L if the 6 Ω resistor is open?   16) _____
   A) 4 V   B) 10 V   C) 8 V   D) 6 V

17) See Figure 6.5. What is the open circuit output voltage V_L?   17) _____
   A) 10 V   B) 4 V   C) 8 V   D) 6 V

18) A Circuit with no available path for current to flow is a/an: 18) _____
   A) Closed Circuit   B) Long Circuit   C) Short Circuit   D) Open Circuit

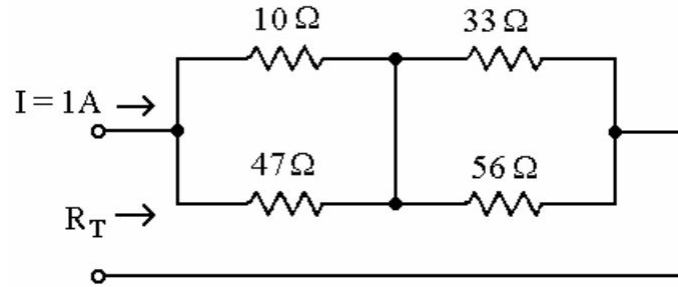**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

10 Ω   33 Ω

I = 1A →

47 Ω   56 Ω

R_T →

Figure 6.4

19) See Figure 6.4. What is the value of the current flowing through the 10 ohm resistor?   19) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

20) Two voltage sources connected in parallel   20) _____
   A) cancel each other, producing a net voltage of zero.
   B) add algebraically.
   C) violate Kirchhoff's voltage law if they have different output voltages.
   D) are more economical than a single large voltage source.