Student's Name:

Introduction to circuit analysis

Homework 2 – Basic Circuit Terminology and basic laws

Instructions:

- You have to show all work in order to receive full credit
- All answer must be in engineering notation rounded off to the hundredth

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1. Convert 0.0003697581 km to mm (millimeters)

2. Convert 13623.58 Ω to kΩ

3. Given the voltage formula $V = \frac{w}{Q}$ If the potential energy between two points is 12.5 V, how much energy is expected to bring 750.8 mC from one point to the other?

For question 4 and 5. Given the current formula $I = \frac{Q}{t}$

4. If a current of 18.75 mA exists for 2.25 hours in a wire, how many coulombs of charge have passed through the wire?

5. How many minutes will a charge of 22.662 mC passes through a light bulb if the current is constant at 125.9 µA

Ohm's Law

6. What is the current through a 2.2Ω resistor if the voltage drop across it is 24 V?

7. If a voltmeter has an internal resistance of 50 kΩ find the current through the meter when it reads 120 V.

8. In a TV camera, a current of 5.6 mA passes through a resistor of 3.3 MΩ What is the voltage drop across the resistor?

Power Law

9. The power consumed by a 2.2 kΩ resistor is 240 mW. What is the current level through the resistor?

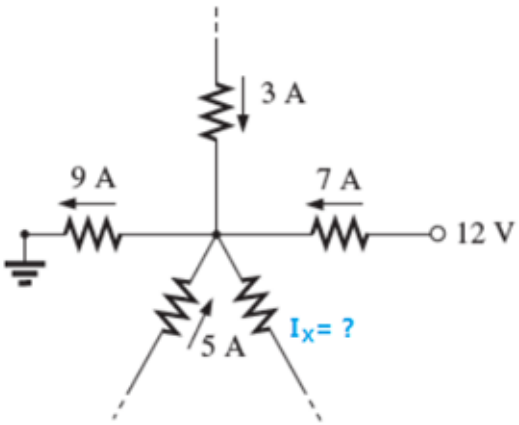
10. A 2.2 kΩ resistor in a stereo system dissipates 42 mW of power. What is the voltage across the resistor?

11. What are the “hot” resistance level and current rating of a 120 V, 100 W bulb?

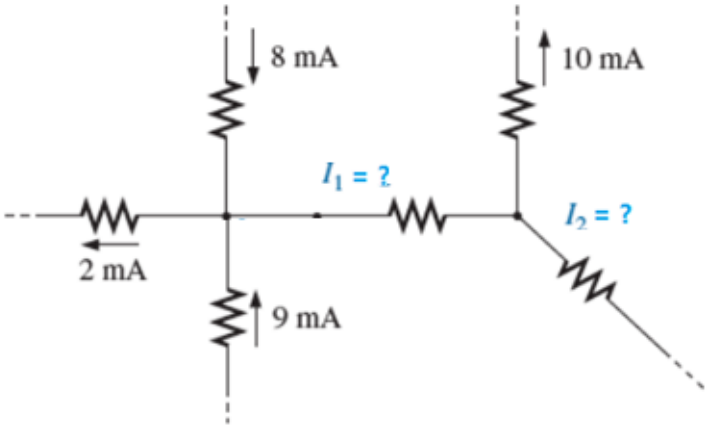
12. What is the power delivered by a 12 V battery if the current drain is 40 A?

Kirchhoff’s t Laws

13. Use Kirchhoff’s Current Law (KCL) to find the unknown current

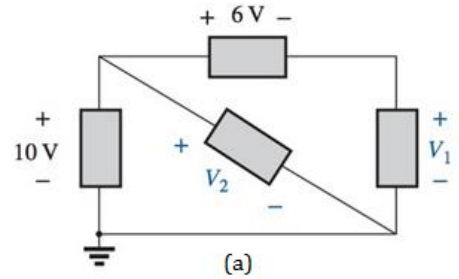


A)

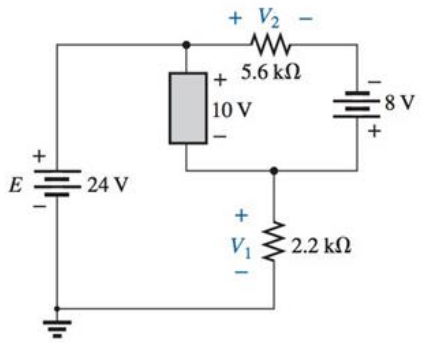


B)

14. Use Kirchhoff's Voltage Law (KVL) to find the unknown voltage



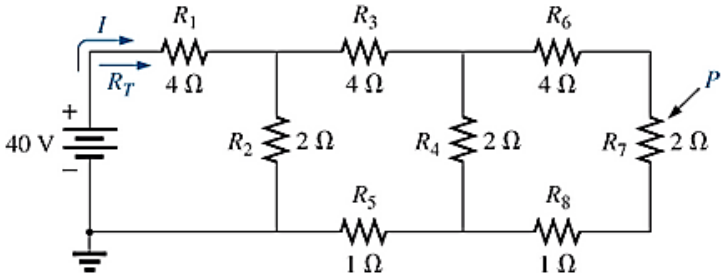
(a)



(b)

Circuit Terminologies

15. For the following circuit,



The number of independent loops is: _____

The number of elements is: _____

The number of nodes is: _____

16. In your own words, what is direct current (dc) and alternating current (ac) _____

_____

_____

_____

_____

Multiple Choices Questions (Circle only ONE correct answer)

17. If an element permits a generous flow of electrons with very little external force is known as _____ and if it does not permit a generous flow of electrons is known as _____.

    a) Insulator, conductor
    b) Conductor, insulator
    c) Conductor, semiconductor
    d) Insulator, semiconductor
    e) Conductor, conductor

18. A voltage source is:
    a. A passive element
    b. An active element
    c. An independent source
    d. A dependent source
    e. A sinewave

19. A resistor is:
    a. A passive element
    b. An active element
    c. An independent source
    d. A dependent source
    e. A sinewave

20. The following electronics symbols is:

    a. A dc current source
    b. An ac current source
    c. A dc voltage source
    d. An ac voltage source
    e. A dc-ac current source
    f. A dc-ac voltage source

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