Final Exam – Fall of 2015

1. Write the expression for Ohm's Law.

2. When measuring the electrical resistance in a circuit the multi-meter should be set to what scale?
   a. Ω
   b. V
   c. A
   d. C
3. When checking a fuse with a multi-meter it is best to test it in a de-energized circuit using the Ohm's setting on a multi-meter.
   a. True
   b. False
4. A multi-meter can be used to check a blown fuse using only the V setting.
   a. True
   b. False
5. A materials ability to oppose current flow is known as it's...

   a. Capacitance
   b. Voltage
   c. Dielectric Constant
   d. Resistance

6. Voltage is dependent on the electric field and is also known as a potential difference.

   a. True
   b. False

7. Resistance in a series circuit is...

   a. Additive... you add up the individual resistances to obtain the total or R_{eq}
   b. Multiplicative ... you multiply the value of each individual resistor to obtain the total or R_{eq}
   c. You add the reciprocals of each individual resistor to obtain the total or R_{eq}

8. According to Kirchoff's Current Law the sum of the currents leaving a node in a multiple branch circuit cannot be greater than the current entering the node.

    a. True
    b. False

9. Current is the flow of...

    a. Protons
    b. Neutrons
    c. Voltage
    d. Electrons

10. When current flows through a copper wire it induces a...

    a. Magnetic field
    b. Current
    c. Resistance
    d. None of the above

11. A transformer operates on the theory of...

    a. Magnetic induction
    b. Capacitance
    c. Resistivity

12. Magnetic Domains are...

    a. The property where the ferrite atoms of a material align their dipoles in a north to south fashion creating a resultant magnetic field.
    b. The property where one atom dominates and sets the magnetic field
    c. The property where the magnetic field is opposite but equal to the electric field
    d. All the above.

13. Fuses and Circuit Breakers are used to protect electrical circuits from...

    a. Over voltage situations
    b. Loss of power
    c. Over current protection
    d. Brown outs

14. If using a multimeter to check for a blown fuse, one should use which method?

    a. Set the multimeter to read ohms and perform a continuity check when the circuit is deenergized.
    b. Set the multimeter to read voltage and check for a voltage drop across the fuse if the circuit is energized.
    c. Both A & B

15. When using a multimeter to check the voltage of an unknown circuit one should start in the highest range and work down one range at a time until a correct reading is obtained.

    a. True
    b. False

16. When testing a circuit's resistance with a multi-meter what should the meter be set on?
    a. V
    b. A
    c. L
    d. Ω

17. Kirchoff's Voltage Law states that the algebraic sum of the voltage drops in a circuit equals zero.
    a. True
    b. False

18. According to Article 358 of the NEC, the use of EMT conduit is not permitted in cases where it will...
    a. Be exposed or concealed
    b. Be in direct contact with the earth
    c. After installation shall be subject to severe physical damage

19. A circuit breaker can be used as both...
    a. Switch and over current protection device
    b. Switch and ground mechanism
    c. Switch and variable rheostat

20. In a circuit breaker panel the neutral lead is connected to the bus that is common with the earth ground.
    a. True
    b. False

21. (Refer to the hand out Article 310.16 Conductors for General Wiring) What do the stars next to the designators 14, 12, and 10 in the kcmil column mean when using these conductors.
    a. A current limit is placed on those conductors
    b. They are not permitted to be used in residential applications
    c. They cannot be used in applications over 100 degrees F

22. According to the chart in Article 310 Conductors for General Wiring, 1/0 Aluminum will carry the same amount of current as 1/0 copper.
    a. True
    b. False

23. According to Article 310.16 Conductors for General Wiring, what cable would you select for a circuit requiring 100 Amps in an area that has an ambient temperature of 160F
    a. No. 3 THHN copper
    b. 4/0 Aluminum
    c. 4/0 Copper
    d. None of the above

24. Chapter 9 Table 8 of the NEC is used for determining the cable resistance of direct current circuits and AC single phase applications.

25. A capacitor is an electrical device for storing energy and can be typically found in...
    a. Resistive circuits such as ranges or ovens
    b. Motor start circuits where they aid in starting a motor
    c. None of the above.

26. According to article 352.10A of the National Electric code PVC conduit is allowed where the conduit is concealed inside walls, ceilings, and under floors.
    a.True
    b. False

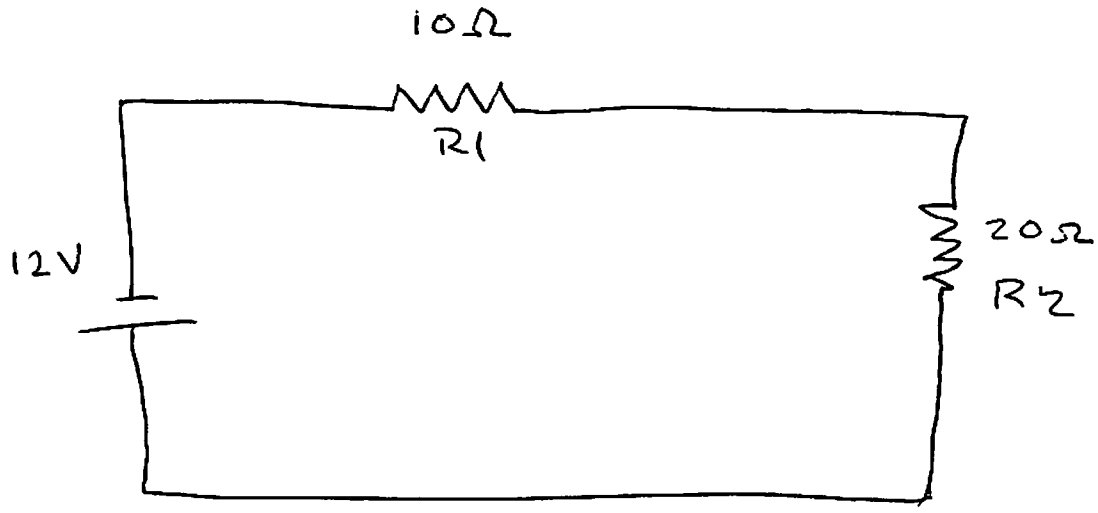
27. What is the maximum number of degrees of the bends allowed in a conduit run or between pull or junction boxes in a conduit run according to the NEC?
    a. 180 degrees
    b. 360 degrees
    c. Unlimited

28. According to Article 358 of the NEC, the use of EMT conduit is not permitted in cases where it will...
    d. Be exposed or concealed
    e. Be in direct contact with the earth
    After installation shall be subject to severe physical damage

29. When dealing with 120 VAC single phase circuits, according to the NEC, the circuits can be treated as DC circuits for the purpose of determining conductor resistance in a branch circuit.
    a. True
    b. False

30. The max recommended voltage drop in a branch circuit in the NEC is 3%.
    a. True
    b. False

-31.



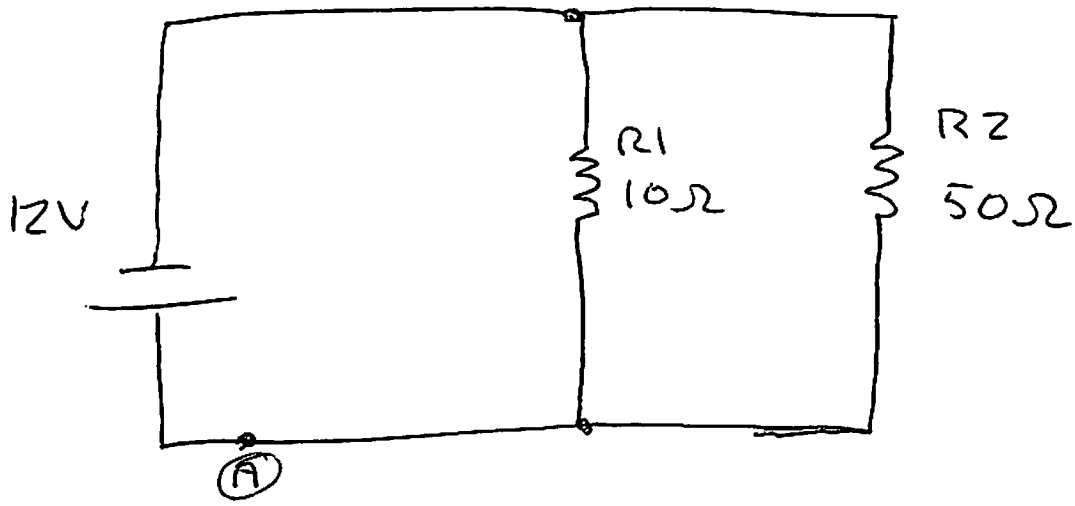
A. WHAT IS THE CIRCUIT'S TOTAL RESISTANCE?

B. WHAT IS THE CURRENT FLOW OF THE CIRCUIT?

C. WHAT IS THE VOLTAGE DROP ACROSS R2?

D. WHAT IS THE VOLTAGE DROP ACROSS R2?

32.



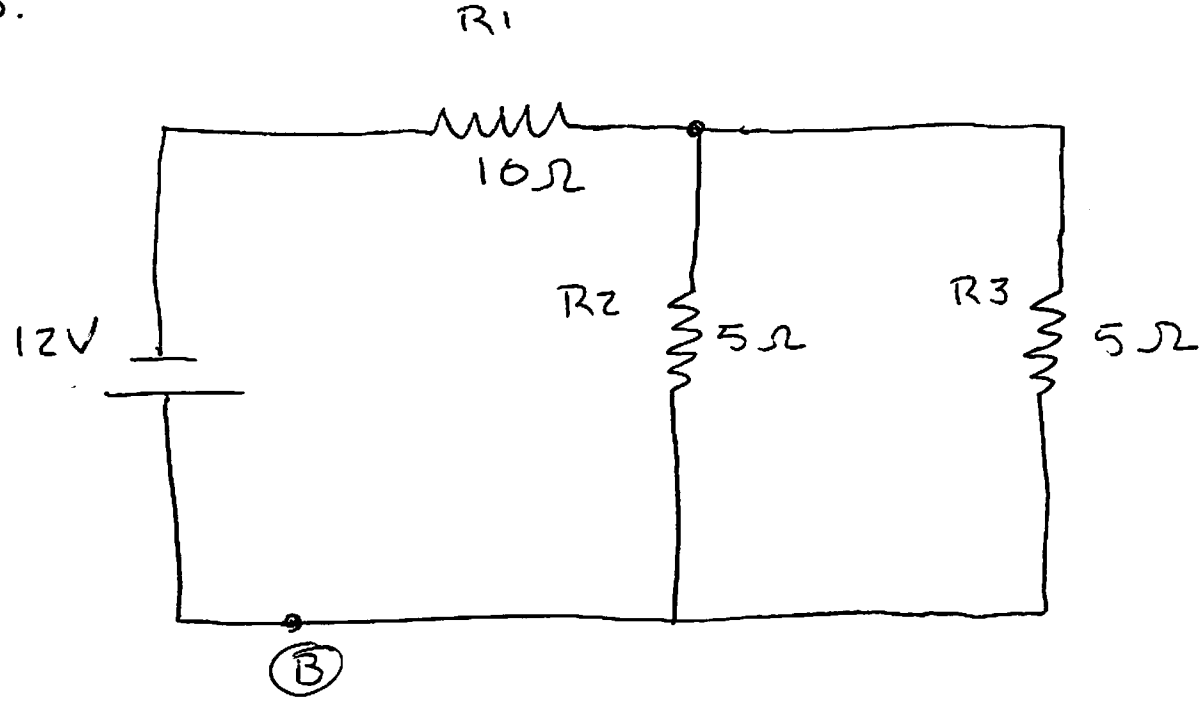
a. WHAT IS THE R_{EQ} OF R1 & R2?

b. WHAT IS THE CURRENT FLOW AT POINT (A)?

c. WHAT IS THE E AT R1?

d. WHAT IS THE CURRENT FLOW AT R2?

33.



a. WHAT IS THE R_{EQ} OF R_2 & R_3?

b. WHAT IS THE RESISTANCE TOTAL OF THE CIRCUIT?

c. WHAT IS THE TOTAL CURRENT FLOW AT POINT (B)

d. WHAT IS THE VOLTAGE DROP (E) ACROSS R1?

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