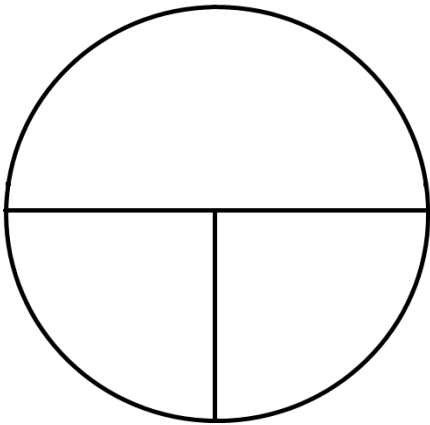


# TI23 Pre-Instructional Survey

Name: \_\_\_\_\_

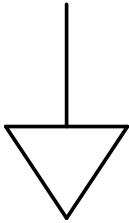
Date: \_\_\_\_\_

1. Identify the balloon contents that represent the relationship between the three electrical measurements as they relate to Ohm's Law.



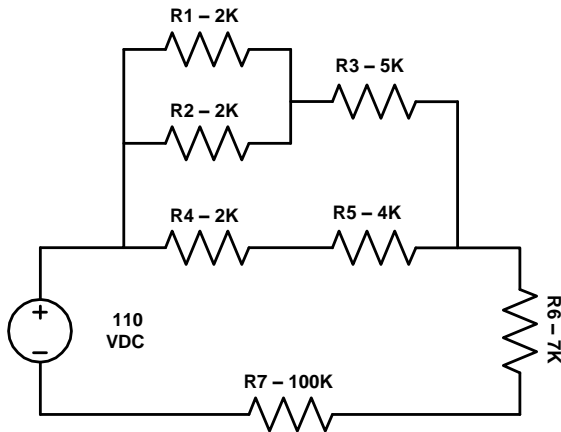
2. Which of the statements listed is correct for the measurement of resistance?
  - A. Resistance is measured in parallel with the circuit deenergized.
  - B. Resistance is measured in series with the circuit energized.
  - C. Resistance is measured in parallel with the circuit deenergized and the device being measured isolated.
  - D. Resistance may be measured in series or parallel as long as the circuit is energized.
3. Which of the listed designations is correct for the National Electrical Code?
  - A. NFPA 77
  - B. NFPA 70E
  - C. NFPA 79
  - D. NFPA 70
4. Purging of enclosures in hazardous areas is cover in
  - A. NFPA 70
  - B. NFPA 496
  - C. NFPA 214
  - D. NFPA 85

5. Identify the symbol shown below.



- A. Earth Ground
- B. Shield Ground
- C. Circuit Common
- D. Chassis Ground

6. Solve for the indicated parameters for the circuit shown below.

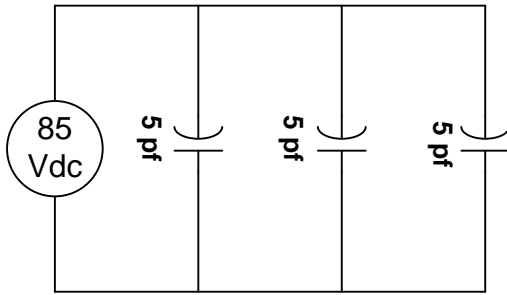


- A. Total Resistance \_\_\_\_\_
- B. Total Current \_\_\_\_\_
- C. Voltage drop across R<sub>1</sub> \_\_\_\_\_
- D. Voltage drop across R<sub>4</sub> \_\_\_\_\_
- E. Voltage drop across R<sub>6</sub> \_\_\_\_\_

7. Which of the listed switch types uses a light source to verify the presents or absence of an object?

- A. Microswitch
- B. Pushbuttons
- C. Reed Switch
- D. Proximity Switch

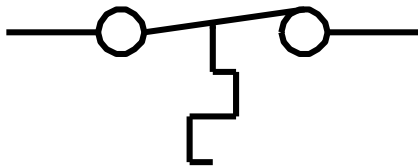
8. What is the total capacitance of the circuit shown below?



- A. 1.67 pF
  - B. 16.7 μf
  - C. 15.0 pf
  - D. 15.0 μf
9. Which statement is not true about standard electrical service fuses?
- A. Some fuses are referred to as one-time fuses.
  - B. Some fuses are referred to as time-delay fuses.
  - C. Some fuses are referred to as over-potential fuses.
  - D. Some fuses are referred to as current limiting non-time delay fuses.
10. Which of the listed solder types is the most frequently used for small electronic and wiring applications?
- A. 65/35
  - B. 37/67
  - C. 50/50
  - D. 63/37
11. What type of circuit break protection should be used for motor control?
- A. Non-automatic circuit interruptor
  - B. Thermal
  - C. Magnetic
  - D. Thermal and Magnetic
12. The three phase power feeds from the power buss are labeled (consider motor control)
- A. L1, L2, L3
  - B. F1, F2, F3
  - C. T1, T2, T3
  - D. P1, P2, P3

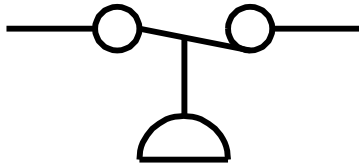
13. What is the RMS voltage for a power system that has a peak-to-peak voltage of 1358 Volts 60 Hertz?
- A. 169 Volts
  - B. 480 Volts
  - C. 240 Volts
  - D. 339 Volts
14. The phase difference between each phase in a 3-phase system is \_\_\_\_?
- A. 180 degrees
  - B. 120 degrees
  - C. 270 degrees
  - D. 90 degrees
15. Which of the wire gauges listed (AWG) has the most resistance per 1000 Feet?
- A. #26
  - B. #20
  - C. #14
  - D. #10
16. Contact blocks are found on which of the listed devices?
- A. Microswitch
  - B. Pushbuttons
  - C. Reed Switch
  - D. Proximity Switch

17. Identify the symbol shown below.



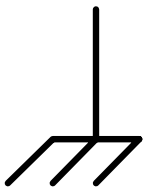
- A. Normally closed – held open temperature switch
- B. Normally open temperature switch
- C. Normally open – held closed temperature switch
- D. Normally closed temperature switch

18. Identify the symbol shown below.



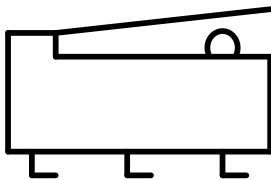
- A. Normally closed – held open pressure switch
- B. Normally open pressure switch
- C. Normally open – held closed pressure switch
- D. Normally closed pressure switch

19. Identify the symbol shown below.



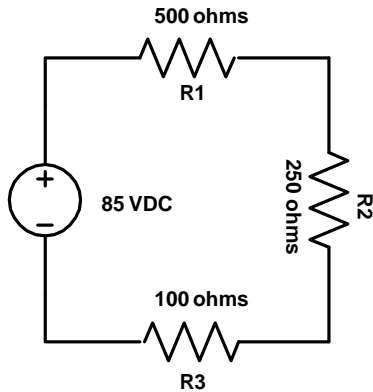
- A. Earth Ground
- B. Shield Ground
- C. Circuit Common
- D. Chassis Ground

20. Identify the terminals on the switch shown below. The position is not important at this point in the course. (correct terminology)



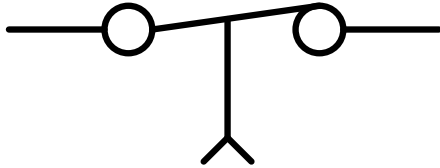
- A. \_\_\_\_\_
- B. \_\_\_\_\_
- C. \_\_\_\_\_

21. Using the circuit shown solve for the indicated values and place your answer in the blank space to its right.



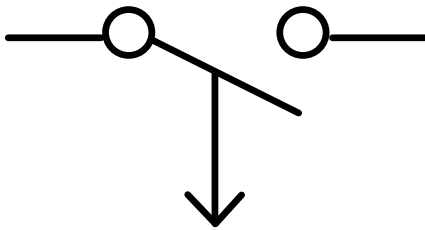
- A. Total Resistance \_\_\_\_\_
- B. Total Current \_\_\_\_\_
- C. Voltage drop across R<sub>1</sub> \_\_\_\_\_
- D. Voltage drop across R<sub>2</sub> \_\_\_\_\_
- E. Voltage drop across R<sub>3</sub> \_\_\_\_\_

22. Identify the symbol shown below.



- A. Normally closed timed open timer contact
- B. Normally open timed closed timer contact
- C. Normally open timed open timer contact
- D. Normally closed timed closed timer contact
23. The current carrying capacity of electrical wiring is known as \_\_\_\_\_.
24. A specially designed switch used specifically to decouple electrical power from the system is called a/an \_\_\_\_\_.
25. A \_\_\_\_\_ is a device that can be locked in place by one control signal and can not be unlocked until a second control signal is initiated.

26. The condition where “radio frequency interference” and/or “electromagnetic interference” is present is called
- A. An electrical anomaly
  - B. Electrical Noise
  - C. Electrical Inteference
  - D. Signal Propagation
27. A device that is used to keep track of the number of times an event takes place is referred to as
- A. Event Controller
  - B. Counter
  - C. Timer
  - D. Event Tracker
28. Which statement is true for the symbol shown below?



- A. An off-delay timer contact that will close when it times out.
  - B. An off-delay timer contact that will open when it times out.
  - C. An off-delay timer contact that will close when its preset is reached.
  - D. An on-delay timer that will open when its preset is reached.
29. The most used troubleshooting strategy used by the control system technician is
- A. Input/Output
  - B. Logical Analysis
  - C. Substitution
  - D. Fault Insertion
30. The connection point for electrically wired controls is referred to as a
- A. Junction
  - B. Termination
  - C. Intersection
  - D. Contact

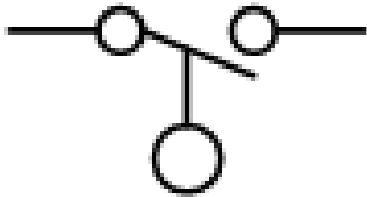
31. A \_\_\_\_\_ is that part of the device being used to complete or interrupt electrical logic circuits after a predetermined amount of time has elapsed.

- A. Circuit Interruptor
- B. Counter Contact
- C. Relay Contact
- D. Timer Contact

32. The terminology used to identify the opening and closing of a relay contact is known as

- A. Opening and Closing
- B. Energizing and Deenergizing
- C. Making and Breaking
- D. Blocking and Passing

33. Identify the symbol shown below.



- A. A float style level switch that is normally closed.
- B. A float style level switch that is normally open – held closed.
- C. A float style level switch that is normally closed – held open.
- D. A float style level switch that is normally open.

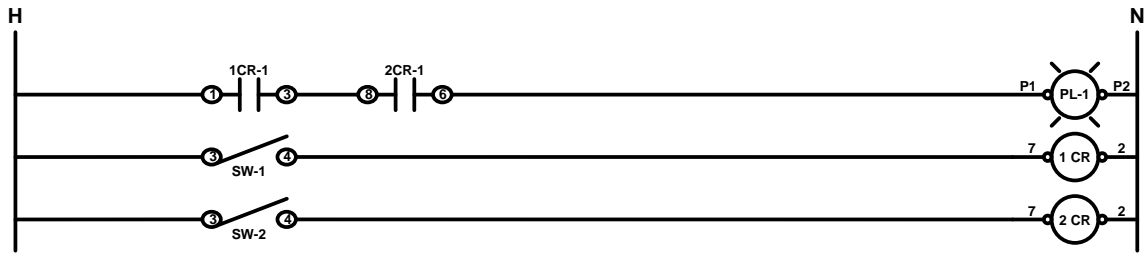
34. Identify the symbol shown below.



- A. A flow switch that is normally closed.
- B. A flow switch that is normally open.
- C. A flow switch that is normally closed – held open.
- D. A flow switch that is normally open – held closed.

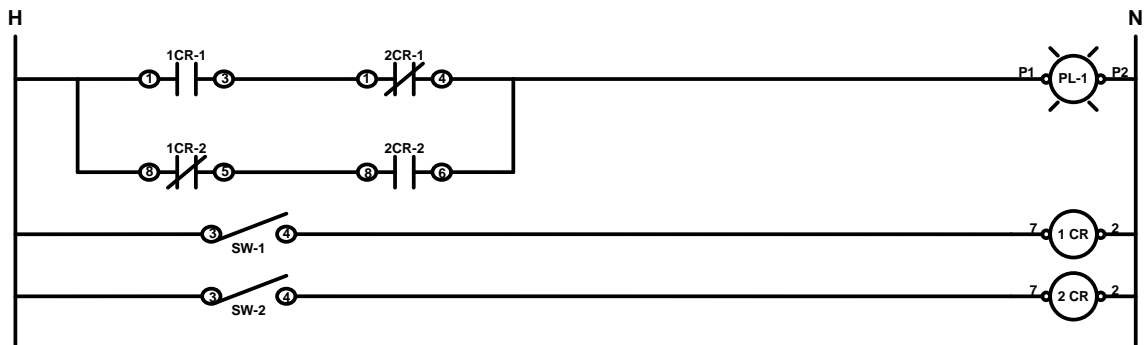


35. Identify the logic gate depicted by the relay ladder logic shown below.



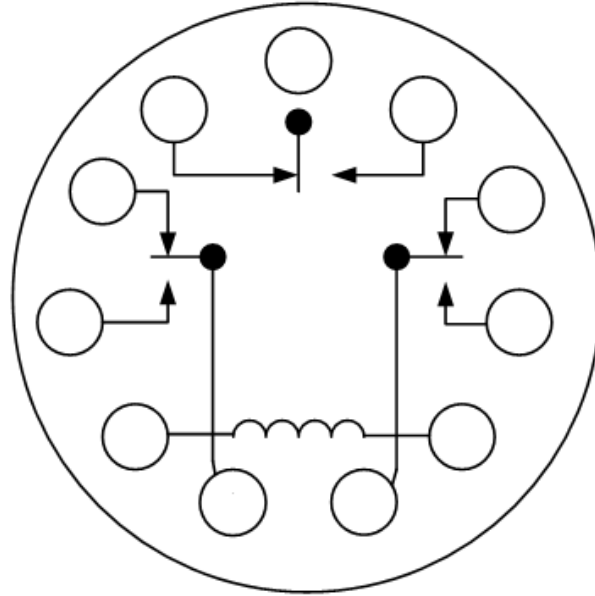
- A. AND
- B. NAND
- C. NOT
- D. OR

36. Identify the electrical logic circuit shown below.

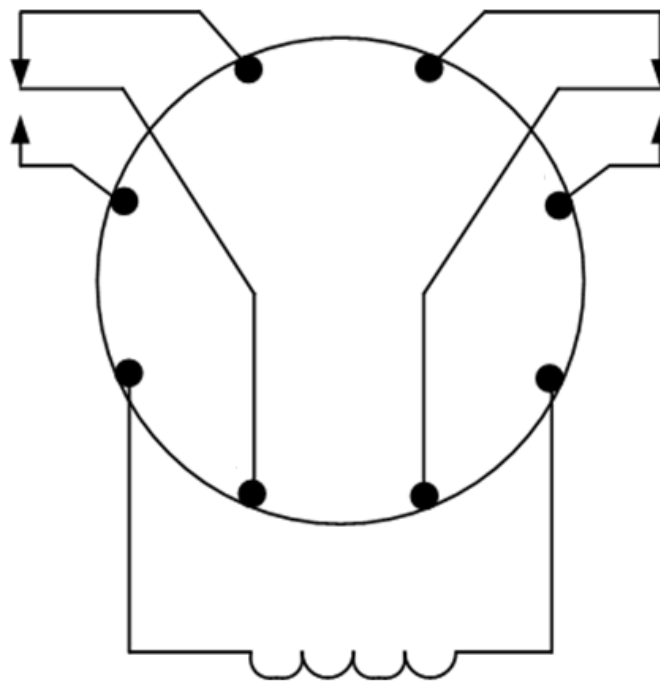


- A. The "Exclusive NOR".
- B. The "Inclusive NOR".
- C. The "Exclusive OR".
- D. The "Inclusive OR".

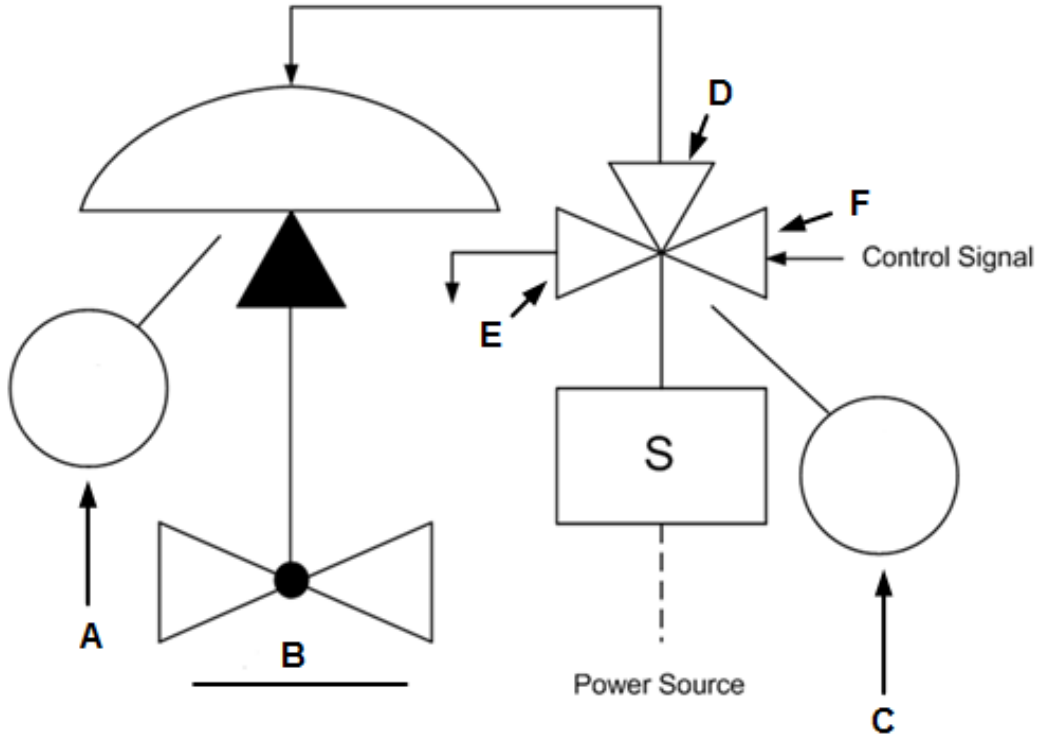
37. Label the terminal numbers indicated by the circles for the eleven-pin relay and block.



38. Label the terminal numbers indicated by the solid circles for the eight-pin relay and block.

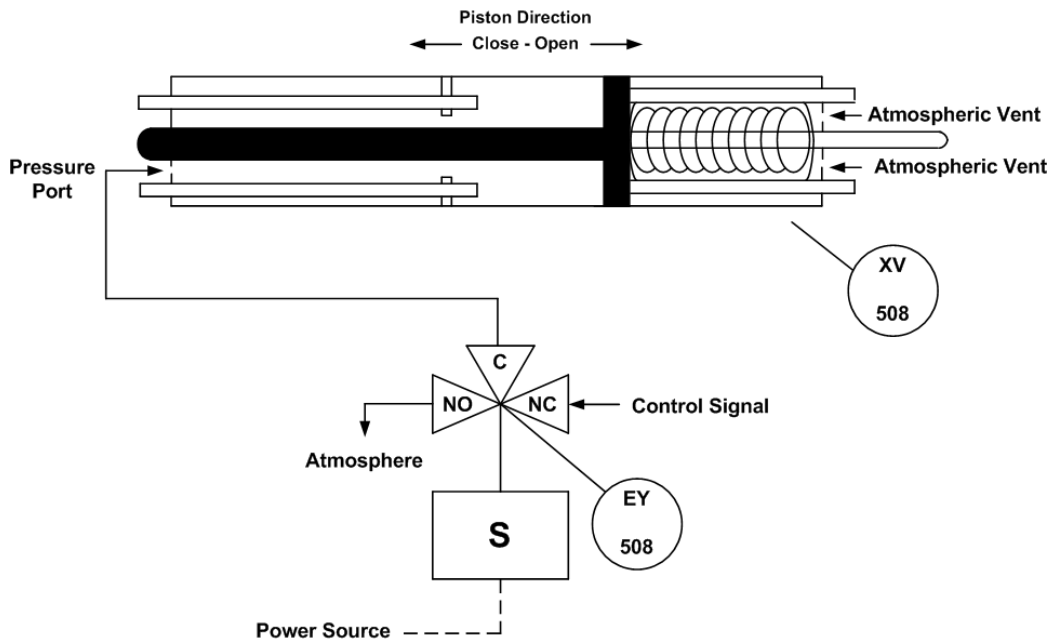


39. Identify the points as indicated for loop #508 by the arrows in the drawing below. The control valve is a single port globe valve.



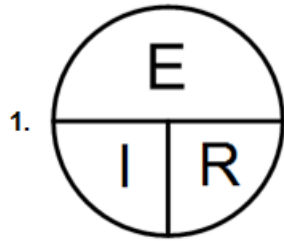
- A. \_\_\_\_\_
- B. \_\_\_\_\_
- C. \_\_\_\_\_
- D. \_\_\_\_\_
- E. \_\_\_\_\_
- F. \_\_\_\_\_

40. Identify the valve configuration shown below.



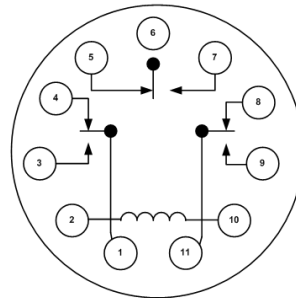
- A. Retentive – Fail Open
- B. Energize to close – Fail Open
- C. Energize to open – Fail Closed
- D. Retentive – Fail Closed

# Pre-Instructional Answers

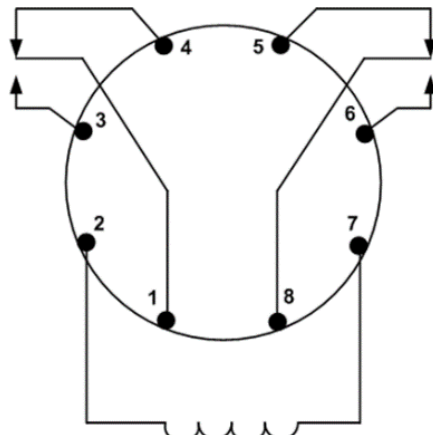


- 2. C
- 3. D
- 4. B
- 5. C
- 6. A. 110 K ohms  
B. 0.001 amps  
C. 3 volts  
D. 7 volts  
E. 100 volts
- 7. D
- 8. C
- 9. C
- 10. D
- 11. D
- 12. A
- 13. B
- 14. B
- 15. A
- 16. D
- 17. D
- 18. C
- 19. D
- 20. A. Common  
B. Norm. Open  
C. Norm. Closed
- 21. A. 850 ohms  
B. 0.1 amps  
C. 50 volts  
D. 25 volts  
E. 10 volts
- 22. A
- 23. Ampacity
- 24. Disconnect
- 25. Latching Relay
- 26. B
- 27. B
- 28. B

- 29. A
- 30. B
- 31. D
- 32. C
- 33. D
- 34. C
- 35. A
- 36. C



37.



38.

- 39. A. FV-508  
B. ATC/FO  
C. EY-508  
D. Common Port  
E. Norm. Open Port  
F. Norm. Closed Port

40. C