UNDERSTANDING AND SERVICING ALARM SYSTEMS

1. We have a 375-ohm loop with a current of 4mA, if we double the resistance but want to maintain the same current, we would __________the voltage?

   A. Halve  
   B. Double  
   C. Square  
   D. None of these

2. The sum of the voltage that rises around a circuit is equal to the sum of the voltage drops around the same circuit is known as ____________?

   A. Ohm's Law  
   B. Kirchoff's First Law  
   C. Newton's Law  
   D. Kirchoff's Second Law

3. Kirchoff's second law states that the sum of all currents entering a point is equal to the sum of all currents leaving that point?

   A. True  
   B. False

4. An ammeter with a built-in battery and a built-in current limiting resistor that is made adjustable to set the zero ohms reading is best known as ____________?

   A. An amprobe  
   B. A voltmeter  
   C. An ohmmeter  
   D. Wattmeter

5. The symbol of infinity on an ohmmeter indicates a ____________circuit?

   A. Closed  
   B. Shorted  
   C. Open  
   D. Hot

6. Voltage is a measurement of ____________?

   A. Electrical current  
   B. Electrical power  
   C. Electrical pressure  
   D. None of the above
7. Shorts in ______ systems will be detected because they will cause an alarm condition
   A. 1 Only  
   B. 2 Only  
   C. 3 Only  
   D. 1 & 2

8. An intermittent problem resulting from a variation in resistance is called a______________?
   A. Short  
   B. Swinger  
   C. Foreign voltage  
   D. Ground

9. A(n)___________ is the simplest kind of protective loop but is not often used because there is no supervision?
   A. Open loop  
   B. Single closed loop  
   C. Break & cross loop  
   D. Double open loop

10. A single closed loop must be closed during a non-alarm condition this system provides?
    A. A bypass when a short occurs across the loop  
    B. Provides supervision  
    C. Provides detection of a broken wire  
    D. A single accidental ground will not affect operation  
    E. All of these

11. A double closed loop circuit with an end of line battery that has an accidental short in the loop will __________. 1. Causes an alarm 2. Quickly drain battery 3. By-pass alarm?
    A. 1 Only  
    B. 2 Only  
    C. 3 Only  
    D. 1 & 2

12. Loop resistance in a typical EOL resistor loop will have a much___________ limit?
    A. Higher  
    B. Lower  
    C. Similar  
    D. Unsteady
13. A device used to allow a system to be armed from inside the building before leaving the premises is commonly referred to as a(n) ____________?

A. Key switch  
B. Entry/exit delay  
C. Shunt switch  
D. Shunt key device

14. The operating voltage of most alarm systems with battery backup is usually _______ or _______. 
   1.) 6 volts  
   2.) 12 volts  
   3.) 24 volts  
   4.) 30 volts?

A. 1 or 2  
B. 3 or 4  
C. 2 or 3  
D. 2 or 4

15. A voltmeter can be used to measure voltage ____________?

A. Outputs and drops  
B. Inputs and drops  
C. A and B  
D. None of the above

16. When replacing batteries it is necessary to ________?

A. Confirm the type of battery the system uses  
B. Replace each battery with its own kind  
C. Connect the batteries with the proper polarity  
D. All of these

17. Batteries with capacities of 30 amp-hours or more are often used for ____________ systems?

A. Industrial  
B. Commercial  
C. Residential  
D. A and B

18. The use of mirrors with a photo beam should preferably be limited to ____________?

A. One  
B. Two  
C. Three  
D. Four
19. A detector that transmits a high radio frequency to look for a frequency shift is known as a

A. Ultrasonic motion detector
B. IR detector
C. Microwave motion detector
D. Sound detector

20. Ultrasonic, microwaves, photoelectric beams and E-field fences are examples of

A. Alarms
B. Alarm signal
C. Alarm systems
D. Active detectors

21. The condition of an alarm system when it is on and ready to be tripped is said to be

A. On
B. Armed
C. Active
D. None of these

22. When two or more cells are arranged to obtain a higher voltage it is called a battery?

A. True
B. False

23. A class transformer is one that limits energy as per the NEC, and used almost universally in alarm work?

A. 1
B. 4
C. 2
D. 3

24. Continuity of a circuit is one that is not

A. Broken
B. Open
C. Interrupted
D. All of these

25. ________ is the amount of electricity being used and is simply equal to the volts times the amps?

A. Power
B. Amps
C. Volts
D. None of the above
26. The first improvement made to the photo beam, was to place a(n) ________ in front of the light source?

A. Incandescent  
B. Laser  
C. Retro-reflector  
D. Infrared filter

27. Solid-state electronics have replaced most __________ devices?

A. Electrical  
B. Alpha-mechanical  
C. Electromechanical  
D. Relay-state

28. The __________ is the worst problem of all to troubleshoot?

A. Swinger  
B. Switch  
C. Fuses  
D. Power

29. A __________ loop provides supervision?

A. Single-closed  
B. Open & shut  
C. Triple-closed  
D. Open

30. The most used transmission path for silent alarms is __________?

A. Telephone lines  
B. Computer  
C. Bell  
D. All of the above

31. Fire Alarm Systems batteries typically have a capacity of __________ ampere-hours or more.

A. 15  
B. 20  
C. 25  
D. 30
32. With the McCulloh transmitter all subscribers are connected in ________ and each subscriber's alarm is transmitted by coded signals?

A. Series  
B. Parallel  
C. Computers  
D. Opposites

33. In the electrical industry VA is an abbreviation for ____________?

A. Vague alarm  
B. Voltage-alternate  
C. Volt-amps  
D. Various alarms

34. The meter will be the test instrument most used by the alarm troubleshooter because of it’s ________?

A. Versatility  
B. Sensitivity  
C. Accuracy  
D. All of the above

35. The Cable Reel, Foil Zapper, Exor-System and Loopstick are different ____________.

A. Alarm systems  
B. Test devices  
C. Installation systems  
D. None of the above

36. ____________ account for the largest percentage of wire troubles?

A. Opens  
B. Shorts  
C. Grounds  
D. Closed

37. When speaking of grounds, a ____________ is generally more reliable?

A. Single loop  
B. Ungrounded loop  
C. Double closed loop  
D. AOL resistor loop

38. ____________ and ____________ are the cause of most resistance fault?

A. Moisture & humidity  
B. Heat & corrosion  
C. Humidity & heat  
D. Moisture & corrosion
39. __________ are time-related problems?
   A. Opens
   B. Swingers
   C. Shorts
   D. Downs

40. A double closed loop can __________?
   A. Have both conductors supervised
   B. Use two circuit conductors
   C. Employ both closed and open circuits
   D. All of the above

41. The __________ resistor loop uses a resistor at the far end to pass a limited current?
   A. End-Of-Line
   B. Variable
   C. Parallel
   D. Tractable

42. Adding an AC signal at the subscriber's premises is considered a __________ security feature?
   A. Normal
   B. Unsupervised
   C. High
   D. Low

43. This feature limits the amount of time the alarm rings?
   A. Low speed
   B. Simple control
   C. Bell timeout
   D. Ring timeout

44. With __________ delay features, it is now possible to locate the on-off Switch inside the protected premises?
   A. Entry/Exit
   B. Bell timeout
   C. On/Off
   D. Simple control
45. Because of its advantages, the _______ loop is, by far, the most popular today?

A. End-Of-Line
B. Variable
C. Parallel
D. Tractable

46. Which method distinguishes between intrusion and line trouble?

A. Simple current
B. McCulloh
C. Telephone-polarity
D. Polarity reversing

47. Today most alarm equipment operates from low-voltage, energy-limiting transformers, per article 725 of the NEC these are usually referred to as _______ transformers?

A. LV
B. Class 2
C. AC/DC
D. Series 2

48. Wire runs between transformer and equipment are usually short and a wire is usually sufficient and for long runs _______ gauge wire would be necessary?

A. 24 or 22 & 16 or 18
B. 18 or 20 & 22 or 24
C. 18 or 16 & 20 or 22
D. 20 or 22 & 18 or 16

49. Which of the following statements is NOT related to the Photoelectric Beams?

A. Mirrors or lenses are not used
B. AKA photo beams, PE beams, PEs, or beams
C. Visible/invisible, steady/pulse
D. Have been around for over 50 years

50. The law, which states that the sum of all currents entering a point is less than the sum of all currents leaving that point?

A. Kirchoffs first law
B. Kirchoffs second law
C. Part of both laws
D. None of the above
51. Voltage is a measurement of ______________.
   A. electrical current
   B. electrical power
   C. electrical pressure
   D. none of the above

52. Loop resistance in a typical end-of-line (E-O-L) resistor loop will have a much ________ limit.
   A. higher
   B. lower
   C. similar
   D. unsteady

53. A voltmeter can be used to measure voltage ____________.
   A. outputs & drops
   B. inputs & drops
   C. A and B
   D. None of the above

54. The law which states that sum of the voltage rises around a circuit is equal to the sum of the voltage drops around the same circuit is ____________.
   A. Kirchoffs first law
   B. Kirchoffs second law
   C. Part of both laws
   D. None

55. Power is expressed in ____________.
   A. amps
   B. watts
   C. volts
   D. all of the above

56. In the electrical industry "VA" is an abbreviation for ____________.
   A. vague alarm
   B. voltage-alternate
   C. volt-amps
   D. various alarms

57. A battery in series with some sort of indicating device as known as a ____________.
   A. Sonalert
   B. Continuity Tester
   C. Light-Emitting Diod
   D. All of the above
58. The meter will be the test instrument most used by the alarm troubleshooter because of its___________.

A. versatility  
B. sensitivity  
C. accuracy  
D. all of the above

59. The cable reel, foil zapper, Exor-System and loop-sticks are different___________.

A. alarm systems  
B. test devices  
C. installation systems  
D. none of the above

60. It is important that ________type batteries be float-charged at the correct, constant voltage.

A. rechargeable  
B. disposable  
C. gel  
D. dry

61. Detecting swingers when troubleshooting is also known as___________.

A. dead batteries  
B. foreign voltages  
C. photoelectric beam  
D. intermittent

62. Solid-state electronics have replaced most__________devices.

A. electrical  
B. alpha-mechanical  
C. electromechanical  
D. relay-state

63. __________account for the largest percentage of wire troubles.

A. opens  
B. shorts  
C. grounds  
D. closed

64. __________in an open loop, double loop and end-of-line systems will be detected because they will cause an alarm condition.

A. opens  
B. shorts  
C. grounds  
D. voltage
65. When speaking of grounds a ____________ system is generally safer.

A. single-loop  
B. ungrounded-loop  
C. double, closed loop  
D. A-O-L resistor loop

66. ____________ and ____________ are the cause of most resistance fault.

A. moisture & humidity  
B. heat & corrosion  
C. humidity & heat  
D. moisture & corrosion

67. The ____________ is the worst problem of all to troubleshoot.

A. swinger  
B. switch  
C. fuses  
D. power

68. A ____________ are time-related problems.

A. opens  
B. swingers  
C. shorts  
D. downs

69. A ____________ loop has no supervision of the wiring.

A. single-closed  
B. closed  
C. double-closed  
D. open

70. A ____________ loop provides supervising.

A. single-closed  
B. open & shut  
C. triple-closed  
D. open
71. A double-closed loop can______________.

A. have both conductors supervised  
B. use two circuit conductors  
C. employ both closed and open circuits  
D. all of the above

72. The __________resistor loop uses a resistor at the far end to pass a limited current.

A. end-of-line  
B. variable  
C. parallel  
D. tractable

73. Which is by far the most popular resistor loop today?

A. end-of-line  
B. variable  
C. parallel  
D. tractable

74. The __________devices should not be wired into the grounded side of any loop.

A. resistor  
B. detection  
C. quad  
D. closed circuit

75. Which of the following loops is used only on direct wire service?

A. make-and-break  
B. open-and-short  
C. break-and-cross  
D. all of the above

76. Adding an AC signal at the subscribers premises is considered a __________security feature.

A. normal  
B. unsupervised  
C. high  
D. low
77. This feature limits the amount of time the alarm rings.
   A. low speed  
   B. simple control  
   C. bell time out  
   D. ring time-out  

78. With ________ delay features, it is now possible to locate the on-off switch inside the protected premises.
   A. entry-exit  
   B. bell time out  
   C. on-and-off  
   D. simple control  

79. The most used transmission path for silent alarms is ____________.
   A. telephone  
   B. computer  
   C. bell  
   D. all of the above  

80. Which method distinguishes between intrusion and line trouble?
   A. simple current  
   B. McCulloh  
   C. Telephone-polarity  
   D. Polarity-reversing  

81. With the McCulloh transmitter all subscribers are connected in ________.
   A. series  
   B. parallel  
   C. computers  
   D. opposites  

82. Since the McCulloh is a party line the Underwriters' Laboratories have limited their subscribers to no more than ________.
   A. 15  
   B. 20  
   C. 25  
   D. 30  

83. Today most alarm equipment operates from low-voltage, energy-limiting transformers, per article 725 of the NEC these are usually referred to as ________ transformers.
   A. LV  
   B. Class 2  
   C. AC/DC  
   D. Series 2
84. As a rule, sealed type lead-acid batteries might last __________; Ni-Cads 4 to 5 yrs & dry cells 1 yr.
   A. 2 to 3 years
   B. 4 to 5 years
   C. 5 to 6 years
   D. 3 to 4 years

85. Wire runs between transformer and equipment are usually short and a _______gauge wire is usually sufficient and for long runs___________gauge wire would be necessary.
   A. 24 or 22 & 16 or 18
   B. 18 or 20 & 22 or 24
   C. 18 or 16 & 20 or 22
   D. 20 or 22 & 18 or 16

86. Fire Alarm Systems batteries typically have a capacity of __________ampere-hours or more.
   A. 15
   B. 20
   C. 25
   D. 30

87. Which of the following statements is NOT related to the Photoelectric Beams?
   A. mirrors or lenses are not used
   B. AKA photo beams, PE beams PE’s or beams
   C. Visible/invisible, steady/pulse
   D. Have been around for over 50 years
## ANSWER KEY

<table>
<thead>
<tr>
<th>Question #</th>
<th>Chapter</th>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. B</td>
<td>1.0 Basic Electricity</td>
<td>1.4 Ohm's Law - Table 1-2</td>
<td>7</td>
</tr>
<tr>
<td>2. B</td>
<td>1.0 Basic Electricity</td>
<td>1.5 Electrical Measure - 1.5.1 Measuring Voltage</td>
<td>11</td>
</tr>
<tr>
<td>3. A</td>
<td>1.0 Basic Electricity</td>
<td>1.5 Electrical Measure - 1.5.2 Measuring Current</td>
<td>14</td>
</tr>
<tr>
<td>4. C</td>
<td>1.0 Basic Electricity</td>
<td>1.5 Electrical Measure - 1.5.3 Measuring Resistance</td>
<td>14</td>
</tr>
<tr>
<td>5. C</td>
<td>1.0 Basic Electricity</td>
<td>1.5 Electrical Measure - 1.5.3 Measuring Resistance</td>
<td>16</td>
</tr>
<tr>
<td>6. C</td>
<td>1.0 Basic Electricity</td>
<td>1.3 Electrical Units - 1.3.1 Voltage</td>
<td>6</td>
</tr>
<tr>
<td>7. D</td>
<td>3.0 Kinds of Trouble</td>
<td>3.3 Loop and Wiring Troubles - 3.3.4 Shorts</td>
<td>58</td>
</tr>
<tr>
<td>8. B</td>
<td>3.0 Kinds of Trouble</td>
<td>3.5 The Swinger</td>
<td>61</td>
</tr>
<tr>
<td>9. A</td>
<td>4.0 Types of Protective Loops</td>
<td>4.1 Open Loop</td>
<td>65</td>
</tr>
<tr>
<td>10. E</td>
<td>4.0 Types of Protective Loops</td>
<td>4.2 Single Closed Loop</td>
<td>68</td>
</tr>
<tr>
<td>11. D</td>
<td>4.0 Types of Protective Loops</td>
<td>4.4 Double Closed Loop</td>
<td>79</td>
</tr>
<tr>
<td>12. B</td>
<td>1.0 Basic Electricity</td>
<td>1.4 Ohm's Law</td>
<td>10</td>
</tr>
<tr>
<td>13. B</td>
<td>7.0 Controls</td>
<td>7.7 Entry/Exit Delay Feature</td>
<td>148</td>
</tr>
<tr>
<td>15. A</td>
<td>1.0 Basic Electricity</td>
<td>1.5 Electrical Measure - 1.5.1 Measuring Voltage</td>
<td>11</td>
</tr>
<tr>
<td>17. D</td>
<td>9.0 Batteries and Power Supplies</td>
<td>9.3 Fire Alarm Systems</td>
<td>169</td>
</tr>
<tr>
<td>18. A</td>
<td>10 Advanced Intrusion Detection Systems</td>
<td>10.1 Photoelectric Beams</td>
<td>756</td>
</tr>
<tr>
<td>19. C</td>
<td>10 Advanced Intrusion Detection Systems</td>
<td>10.4 Microwave Motion Detectors</td>
<td>182</td>
</tr>
<tr>
<td>20. D</td>
<td>Glossary</td>
<td>Active Detector</td>
<td>207</td>
</tr>
<tr>
<td>Question #</td>
<td>Chapter</td>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------</td>
<td>----------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>22. A</td>
<td>Glossary</td>
<td>Battery - True</td>
<td>209</td>
</tr>
<tr>
<td>23. C</td>
<td>Glossary</td>
<td>Class II Transformer</td>
<td>211</td>
</tr>
<tr>
<td>24. D</td>
<td>Glossary</td>
<td>Continuity - Open</td>
<td>213</td>
</tr>
<tr>
<td>25. A</td>
<td>1.0 Basic Electricity</td>
<td>1.6 Power</td>
<td>17</td>
</tr>
<tr>
<td>26. D</td>
<td>10 Advanced Intrusion</td>
<td>10.1 Photoelectric Beams</td>
<td>174</td>
</tr>
<tr>
<td></td>
<td>Detection Systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. C</td>
<td>3.0 Kinds of Trouble</td>
<td>3.2 Equipment Trouble - 3.2.7 Mechanical Adjustments</td>
<td>55</td>
</tr>
<tr>
<td>28. A</td>
<td>3.0 Kinds of Trouble</td>
<td>3.5 The Swinger</td>
<td>61</td>
</tr>
<tr>
<td>29. A</td>
<td>4.0 Types of Protective</td>
<td>4.2 Single Closed Loop</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>Loops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. A</td>
<td>8.0 Silent Alarms and</td>
<td>Overview</td>
<td>151</td>
</tr>
<tr>
<td></td>
<td>Local Bells</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Supplies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. A</td>
<td>8.0 Silent Alarms and</td>
<td>8.4 McCulloh Transmitters</td>
<td>153</td>
</tr>
<tr>
<td></td>
<td>Local Bells</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. C</td>
<td>1.0 Basic Electricity</td>
<td>1.6 Power</td>
<td>17</td>
</tr>
<tr>
<td>34. D</td>
<td>2.0 Test Equipment</td>
<td>2.4 Meters - 2.4.1 Versatility</td>
<td>23</td>
</tr>
<tr>
<td>35. B</td>
<td>2.0 Test Equipment</td>
<td>2.5 Test Cable Reel - 2.8 Loopstick</td>
<td>27-35</td>
</tr>
<tr>
<td>36. A</td>
<td>3.0 Kinds of Trouble</td>
<td>3.3 Loop and Wiring Troubles - 3.3.3 Opens</td>
<td>57</td>
</tr>
<tr>
<td>37. C</td>
<td>3.0 Kinds of Trouble</td>
<td>3.3 Loop and Wiring Troubles - 3.3.5 Grounds</td>
<td>59</td>
</tr>
<tr>
<td>38. D</td>
<td>3.0 Kinds of Trouble</td>
<td>3.4 Resistance Faults</td>
<td>60</td>
</tr>
<tr>
<td>39. B</td>
<td>3.0 Kinds of Trouble</td>
<td>3.5 The Swinger</td>
<td>61</td>
</tr>
<tr>
<td>40. D</td>
<td>4.0 Types of Protective</td>
<td>4.4 Double Closed Loop</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Loops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41. A</td>
<td>4.0 Types of Protective</td>
<td>4.7 End-Of-Line Resistor (Terminator) Loop</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Loops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42. C</td>
<td>4.0 Types of Protective</td>
<td>4.8 On-Premise Multiplexed Loop</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>Loops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>43. C</td>
<td>7.0 Controls</td>
<td>7.4 Bell Timeout Feature</td>
<td>144</td>
</tr>
<tr>
<td>Question #</td>
<td>Chapter</td>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>------------</td>
<td>---------</td>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>44. A</td>
<td>7.0 Controls</td>
<td>7.7 Entry/Exit Delay Feature</td>
<td>148</td>
</tr>
<tr>
<td>45. A</td>
<td>4.0 Types of Protective Loops</td>
<td>4.7 End-Of-Line Resistor (Terminator) Loop</td>
<td>88</td>
</tr>
<tr>
<td>46. D</td>
<td>8.0 Silent Alarms and Local Bells</td>
<td>8.3 Polarity Reversing</td>
<td>153</td>
</tr>
<tr>
<td>47. B</td>
<td>9.0 Batteries and Power Supplies</td>
<td>9.1 Batteries</td>
<td>161</td>
</tr>
<tr>
<td>48. D</td>
<td>9.0 Batteries and Power Supplies</td>
<td>9.2 Power Supplies</td>
<td>169</td>
</tr>
<tr>
<td>49. A</td>
<td>10 Advanced Intrusion Detection Systems</td>
<td>10.1 Photoelectric Beams</td>
<td>173</td>
</tr>
<tr>
<td>50. D</td>
<td>1.0 Basic Electricity</td>
<td>1.5 Electrical Measurements - 1.5.2 Measuring Current</td>
<td>14</td>
</tr>
<tr>
<td>51. C</td>
<td>1.0 Basic Electricity</td>
<td>1.3 Electrical Units - 1.3.1 Voltage</td>
<td>10</td>
</tr>
<tr>
<td>52. B</td>
<td>1.0 Basic Electricity</td>
<td>1.5 Electrical Measurements - 1.5.1 Measuring Voltage</td>
<td>10</td>
</tr>
<tr>
<td>53. A</td>
<td>1.0 Basic Electricity</td>
<td>1.5 Electrical Measure - 1.5.1 Measuring Voltage</td>
<td>10</td>
</tr>
<tr>
<td>54. A</td>
<td>1.0 Basic Electricity</td>
<td>1.5 Electrical Measure - 1.5.1 Measuring Voltage</td>
<td>10</td>
</tr>
<tr>
<td>55. B</td>
<td>1.0 Basic Electricity</td>
<td>1.6 Power</td>
<td>10</td>
</tr>
<tr>
<td>56. C</td>
<td>1.0 Basic Electricity</td>
<td>1.6 Power</td>
<td>10</td>
</tr>
<tr>
<td>57. B</td>
<td>2.0 Test Equipment</td>
<td>2.4 Meters - 2.4.2</td>
<td>10</td>
</tr>
<tr>
<td>58. D</td>
<td>2.0 Test Equipment</td>
<td>2.4 Meters - 2.4.1 Versatility</td>
<td>10</td>
</tr>
<tr>
<td>59. B</td>
<td>2.0 Test Equipment</td>
<td>2.5 Test Cable Reel - 2.5.1</td>
<td>10</td>
</tr>
<tr>
<td>60. C</td>
<td>3.0 Kinds of Trouble</td>
<td>3.1</td>
<td>10</td>
</tr>
<tr>
<td>61. D</td>
<td>3.0 Kinds of Trouble</td>
<td>3.2 Equipment Trouble - 3.2.7 Mechanical Adjustments</td>
<td>10</td>
</tr>
<tr>
<td>62. C</td>
<td>3.0 Kinds of Trouble</td>
<td>3.3 Loop and Wiring Troubles - 3.3.3 Opens</td>
<td>10</td>
</tr>
<tr>
<td>63. A</td>
<td>3.0 Kinds of Trouble</td>
<td>3.3 Loop and Wiring Troubles - 3.3.4</td>
<td>10</td>
</tr>
<tr>
<td>64. B</td>
<td>3.0 Kinds of Trouble</td>
<td>3.3 Loop and Wiring Troubles - 3.3.4</td>
<td>10</td>
</tr>
<tr>
<td>Question #</td>
<td>Chapter</td>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------</td>
<td>----------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>65. C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>66. D</td>
<td>3.0 Kinds of Trouble</td>
<td>3.4 Resistance Faults</td>
<td>59</td>
</tr>
<tr>
<td>67. A</td>
<td>3.0 Kinds of Trouble</td>
<td>3.5 The Swinger</td>
<td></td>
</tr>
<tr>
<td>68. B</td>
<td>3.0 Kinds of Trouble</td>
<td>3.5 The Swinger</td>
<td></td>
</tr>
<tr>
<td>69. D</td>
<td>4.0 Types of Protective Loops</td>
<td>4.1 Open Loop</td>
<td></td>
</tr>
<tr>
<td>70. A</td>
<td>4.0 Types of Protective Loops</td>
<td>4.2 Single Closed Loop</td>
<td></td>
</tr>
<tr>
<td>71 D</td>
<td>4.0 Types of Protective Loops</td>
<td>4.4 Double Closed Loop</td>
<td></td>
</tr>
<tr>
<td>72. A</td>
<td>4.0 Types of Protective Loops</td>
<td>4.7 End-Of-Line Resistor (Terminator) Loop</td>
<td></td>
</tr>
<tr>
<td>73. A</td>
<td>4.0 Types of Protective Loops</td>
<td>4.7 End-Of-Line Resistor (Terminator) Loop</td>
<td></td>
</tr>
<tr>
<td>74. B</td>
<td>4.0 Types of Protective Loops</td>
<td></td>
<td>Fig. 4-34</td>
</tr>
<tr>
<td>75. D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>76. C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>77. C</td>
<td>7.0 Controls</td>
<td>7.4 Bell Timeout Feature</td>
<td></td>
</tr>
<tr>
<td>78. A</td>
<td>7.0 Controls</td>
<td>7.7 Entry/Exit Delay Feature</td>
<td></td>
</tr>
<tr>
<td>79. A</td>
<td>8.0 Silent Alarms and Local Bells</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>80. D</td>
<td>8.0 Silent Alarms and Local Bells</td>
<td>8.3 Polarity Reversing</td>
<td></td>
</tr>
<tr>
<td>81. A</td>
<td>8.0 Silent Alarms and Local Bells</td>
<td>8.4 McCulloh Transmitters</td>
<td></td>
</tr>
<tr>
<td>82. A</td>
<td>8.0 Silent Alarms and Local Bells</td>
<td>8.4 McCulloh Transmitters</td>
<td></td>
</tr>
<tr>
<td>Question #</td>
<td>Chapter</td>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------</td>
<td>--------------------------</td>
<td>------</td>
</tr>
<tr>
<td>83. B</td>
<td>9.0 Batteries and Power Supplies</td>
<td>9.1 Batteries</td>
<td></td>
</tr>
<tr>
<td>84. D</td>
<td>9.0 Batteries and Power Supplies</td>
<td>9.1 Batteries</td>
<td></td>
</tr>
<tr>
<td>85. D</td>
<td>9.0 Batteries and Power Supplies</td>
<td>9.2 Power Supplies</td>
<td></td>
</tr>
<tr>
<td>86. D</td>
<td>9.0 Batteries and Power Supplies</td>
<td>9.3 Fire Alarm Systems</td>
<td></td>
</tr>
<tr>
<td>87. A</td>
<td>10 Advanced Intrusion Detection Systems</td>
<td>10.1 Photoelectric Beams</td>
<td></td>
</tr>
</tbody>
</table>