

LEVEL I — SIMULATION EXAM 2 (85 QUESTIONS)

Time Limit: 110 Minutes

Allowed References: NFPA 72 (2022), NFPA 70 (2020), Ugly's Electrical References (2020)

DOMAIN 1.1 — INSTALLATION (Questions 1–46)

1. A fire alarm technician is reviewing the cable requirements for a fire alarm circuit that will run vertically through four floors of a commercial building. Which cable rating is the minimum requirement for this application?

- A. FPL because the cable will be enclosed in metallic conduit throughout the riser
- B. FPLP because all vertical runs require plenum-rated cable regardless of air handling
- C. THHN because riser-rated insulation is only required in unprotected shafts
- D. FPLR because the cable passes through more than one floor in a riser application

2. A fire alarm technician is connecting two 12-volt batteries to provide 24 VDC secondary power for a fire alarm panel. One battery terminal post appears corroded. What action should be taken before making the connection?

- A. Apply petroleum jelly to the corroded terminal to prevent further oxidation
- B. Clean the corrosion from the terminal to ensure a low-resistance connection
- C. Leave the corrosion in place since it does not affect battery performance
- D. Replace only the corroded terminal post using a universal battery terminal kit

3. Per NFPA 72, what is the maximum distance from any wall-ceiling junction at which a ceiling-mounted smoke detector can be wall-mounted as an alternative?

- A. Within 12 inches of the ceiling measured to the top of the detector
- B. Within 4 inches of the ceiling measured to the top of the detector
- C. Within 6 inches of the ceiling measured to the center of the detector
- D. Within 24 inches of the ceiling measured to the bottom of the detector

4. A fire alarm technician is selecting a heat detector for a commercial kitchen where ambient temperatures regularly reach 115°F. Per NFPA 72, the detector's rated activation temperature must be at least how far above the maximum ambient?

- A. 10°F above the maximum expected ambient temperature
- B. 15°F above the maximum expected ambient temperature
- C. 20°F above the maximum expected ambient temperature
- D. 30°F above the maximum expected ambient temperature

5. During installation of fire alarm conduit, the technician has already made two 90-degree bends and one 45-degree bend in a single run. How many additional degrees of bends are permitted before a pull box is required?

- A. 135 degrees remaining before a pull box must be added to the run
- B. 180 degrees remaining before a pull box must be added to the run
- C. 90 degrees remaining before a pull box must be added to the run
- D. 45 degrees remaining before a pull box must be added to the run

6. A fire alarm control panel is being installed in a new building. The primary AC power connection must be made to a branch circuit with which characteristic?

- A. A circuit shared with the building's emergency lighting system only
- B. A circuit controlled by a keyed switch accessible to maintenance staff
- C. A circuit protected by an arc-fault circuit interrupter at the panel board
- D. A circuit identified with a distinctive permanent marking at the distribution panel

7. Which of the following correctly describes the function of a monitor module in an addressable fire alarm system?

- A. It receives commands from the panel and activates a relay output for control functions
- B. It accepts a conventional contact input and reports the device status to the panel over the SLC
- C. It converts analog detector readings into digital signals for panel processing
- D. It provides supplemental power to notification appliances located far from the panel

8. A fire alarm technician needs to determine whether 16 AWG THHN conductors can be installed in a 1/2-inch EMT conduit along with existing conductors. Which NEC reference provides the maximum conductor count for this combination?

- A. NEC Chapter 9, Table 5 which lists conductor cross-sectional areas
- B. NEC Annex C, Table C1 which lists maximum conductor counts for EMT
- C. NEC Article 310, Table 310.16 which lists conductor ampacity ratings
- D. NEC Chapter 9, Table 1 which lists maximum fill percentages by conductor count

9. On a construction site, a fire alarm technician needs to work on a scaffold that is 8 feet above the ground. Per OSHA regulations, which safety measure is required at this elevation?

- A. No fall protection is required because the height is below 10 feet

- B. Only a safety harness is required without a tie-off anchor point
- C. Fall protection such as guardrails or a personal fall arrest system is required
- D. Only a warning line system around the scaffold perimeter is required

10. A fire alarm system uses Class B wiring on its notification appliance circuits. If a single open fault occurs on one of these circuits, what is the operational consequence?

- A. All appliances beyond the point of the open fault will not operate during an alarm
- B. All appliances on the entire circuit will fail because the EOLR supervision is lost
- C. The panel will automatically reroute signals through an alternate communication path
- D. Only the appliance immediately adjacent to the fault will fail to operate properly

11. A fire alarm technician is reviewing the requirements for a fire alarm panel's dedicated branch circuit. Which device is specifically prohibited from being installed on this circuit?

- A. A thermal-magnetic circuit breaker with a lock-on attachment device
- B. A disconnect switch located within sight of the fire alarm control unit
- C. A circuit breaker with an identification label at the electrical distribution panel
- D. A ground-fault circuit interrupter designed to detect leakage current to ground

12. Per NEC Article 760, power-limited fire alarm circuits must be separated from which of the following?

- A. Other power-limited fire alarm circuits from the same fire alarm system
- B. Low-voltage signaling line circuits operating below 24 VDC on the same panel
- C. Electric light, power, and Class 1 circuits unless specific exceptions are met
- D. Other low-voltage systems only when both are installed in nonmetallic raceways

13. A fire alarm technician is preparing to pull fire alarm cable through a conduit run. Before beginning the wire pull, what should the technician verify about the conduit?

- A. The conduit is clear of obstructions and all cut ends are deburred to prevent insulation damage
- B. The conduit has been filled with pulling lubricant to its maximum capacity before the pull
- C. The conduit is grounded at both ends with a bonding conductor independent of the cable
- D. The conduit has been pressure tested to verify there are no air leaks at the fittings

14. What type of fire alarm system identifies each device by a unique electronic address and communicates with devices individually over a signaling line circuit?

- A. An addressable fire alarm system using SLC communication with each device
- B. A conventional fire alarm system using zone-based identification methods
- C. A municipal fire alarm system using dedicated telephone line communication
- D. A wireless fire alarm system using radio frequency identification protocols

15. A fire alarm technician discovers that an electrician has run 120 VAC power conductors in the same conduit as the fire alarm signaling line circuit conductors. What must be done to correct this condition?

- A. Install a physical barrier inside the conduit to separate the fire alarm and power conductors
- B. Remove the fire alarm conductors and reinstall them in a separate dedicated raceway
- C. Verify that both sets of conductors have the same insulation voltage rating and document
- D. Add a ground conductor to the conduit to provide a reference for both circuit types

16. A photoelectric smoke detector uses what principle to detect the presence of smoke particles in its sensing chamber?

- A. Ionized air molecules are disrupted by smoke reducing current flow between plates

- B. Infrared radiation from smoke particles is measured by a calibrated thermal sensor
- C. A semiconductor element changes resistance proportionally to smoke concentration
- D. Smoke particles scatter a light beam onto a photosensitive receiver triggering an alarm

17. When installing fire alarm cable in an exposed location less than 7 feet above the floor in a storage area, what protection does NEC Article 760 require?

- A. The cable must be labeled with "FIRE ALARM" at intervals not exceeding 4 feet
- B. The cable must be supported with cable ties at intervals not exceeding 18 inches
- C. The cable must be installed in a raceway to protect it from physical damage
- D. The cable must be plenum-rated regardless of the air handling configuration

18. In a conventional fire alarm system, the end-of-line resistor is installed at which location on a Class B initiating device circuit?

- A. At the last device on the circuit, providing the supervision reference for the panel
- B. At the fire alarm control panel terminals where the circuit originates
- C. At the midpoint of the circuit to balance the supervision resistance equally
- D. At every device on the circuit to provide individual device supervision capability

19. A fire alarm technician is installing a manual fire alarm station near an exit door. The door opens outward into the corridor. Where should the pull station be mounted relative to the door?

- A. On the door itself so that occupants can activate the alarm while opening the door
- B. On the wall within 5 feet of the exit doorway at a height between 42 and 48 inches
- C. On the opposite wall facing the exit door so it is visible when approaching from either direction
- D. On the ceiling directly above the exit door with a pull chain extending to accessible height

20. Two resistors with values of 470 ohms each are connected in parallel on a fire alarm circuit. What is the total equivalent resistance of this parallel combination?

- A. 940 ohms because parallel resistance adds the individual resistance values together
- B. 470 ohms because parallel resistance equals the value of the largest single resistor
- C. 117.5 ohms because parallel resistance is one-quarter of a single resistor value
- D. 235 ohms because equal resistors in parallel produce half the individual resistance value

21. A fire alarm technician is installing cable in a ceiling space. The mechanical drawings indicate that the HVAC system uses a ducted return with dedicated return air ductwork. The space above the ceiling grid is not used for air handling. Which of the following cable types is acceptable for this installation?

- A. Only FPLP cable can be used in any commercial ceiling space installation
- B. Only FPLR cable can be used because the ceiling space is above the first floor
- C. Only THHN conductors in conduit are permitted in commercial ceiling applications
- D. FPL, FPLR, or FPLP cable are all acceptable since the space is not a plenum

22. Using Ohm's Law, what is the current flowing through a circuit with 24 volts applied across a resistance of 8 ohms?

- A. 192 amps calculated by multiplying voltage times resistance
- B. 3 amps calculated by dividing voltage by resistance
- C. 0.33 amps calculated by dividing resistance by voltage
- D. 32 amps calculated by adding voltage and resistance together

23. Which of the following devices generates a supervisory signal rather than an alarm signal when it activates?

- A. A smoke detector installed in an elevator lobby detecting smoke presence

- B. A manual fire alarm station activated by a building occupant near an exit
- C. A tamper switch on a sprinkler control valve indicating the valve has moved
- D. A waterflow switch detecting water flow in sprinkler system piping

24. A fire alarm technician is testing wiring continuity on a newly installed circuit. The multimeter reads 0.2 ohms between the two conductors at the panel end. What does this indicate?

- A. The conductors are continuous with normal wire resistance for the circuit length
- B. The circuit has a ground fault between one conductor and the metallic raceway
- C. The end-of-line resistor is missing and must be installed before system startup
- D. The reading is too high and indicates a high-resistance connection somewhere

25. What is the minimum conductor size commonly used for notification appliance circuits that carry higher alarm current loads?

- A. 18 AWG which is the standard minimum for all fire alarm circuit applications
- B. 14 AWG which provides adequate ampacity and acceptable voltage drop performance
- C. 22 AWG which is the minimum permitted by NEC Article 760 for PLFA circuits
- D. 10 AWG which is required for any circuit exceeding 1 amp of total alarm current

26. A fire alarm technician must install a smoke detector on a ceiling that has a peaked roof structure. At what location on the peaked ceiling should the detector be placed per NFPA 72?

- A. At the exact peak of the ceiling where the two slopes meet at the ridge line
- B. At the midpoint of the ceiling slope for balanced coverage of the entire space
- C. At the lowest point of the ceiling near the eave where smoke settles naturally
- D. Within 3 feet of the peak measured horizontally from the highest point of the ceiling

27. A conventional fire alarm panel displays "TROUBLE — ZONE 6" on its LCD screen. The technician measures the resistance at the Zone 6 IDC terminals and reads near zero ohms. What is the most likely cause?

- A. The end-of-line resistor has been removed from the last device on the Zone 6 circuit
- B. A device on Zone 6 has activated and is generating an alarm condition on the circuit
- C. A short circuit exists between the two conductors somewhere on the Zone 6 wiring
- D. The Zone 6 circuit has an open conductor between the panel and the first device

28. What personal protective equipment is considered minimum standard for a fire alarm technician working on a construction site?

- A. Hard hat, safety glasses, safety-toed footwear, and work gloves appropriate for the task
- B. Safety glasses and work gloves only because fire alarm work is low-voltage
- C. Hard hat only because fire alarm technicians work primarily above ceiling level
- D. Steel-toed boots and a high-visibility vest without additional PPE requirements

29. Which type of smoke detector responds fastest to slow-smoldering fires that produce large visible smoke particles?

- A. Ionization detectors because they sense the electrical charge changes caused by smoke
- B. Multi-criteria detectors because they combine all sensing technologies simultaneously
- C. Photoelectric detectors because they detect light scattering from large smoke particles
- D. Aspirating detectors because they continuously sample air from the protected space

30. A fire alarm technician is using a tone generator and amplifier probe on the job site. What is this tool primarily used for?

- A. Testing the alarm tone output level of audible notification appliances in decibels

- B. Identifying and tracing individual wires within a bundle or conduit raceway
- C. Generating a test signal to verify communication with the supervising station
- D. Measuring the frequency of the temporal-three alarm notification pattern

31. A notification appliance circuit operates at 24 VDC and powers devices drawing a total of 2 amps in alarm. Using NEC Chapter 9, Table 8, the round-trip wire resistance for the 14 AWG circuit is 1.57 ohms. What is the voltage drop on this circuit?

- A. 3.14 volts calculated by multiplying total current by total wire resistance
- B. 12.0 volts calculated by multiplying current by one-way wire resistance only
- C. 1.57 volts equal to the total wire resistance in the circuit expressed in volts
- D. 48.0 volts calculated by multiplying circuit voltage by total current draw

32. Per OSHA lockout/tagout procedures, what is the correct sequence after shutting down equipment and isolating energy sources?

- A. Begin work immediately after turning off the circuit breaker at the panel
- B. Verify de-energization, then begin work without applying lockout devices
- C. Notify affected personnel and wait 10 minutes for stored energy to dissipate
- D. Apply lockout devices and tags, then verify de-energization before beginning work

33. Which of the following wiring configurations provides the highest level of fault tolerance for a signaling line circuit in an addressable fire alarm system?

- A. Class B with an end-of-line resistor at the last device for circuit supervision
- B. Class A with conductors routed in a loop that leaves and returns to the panel
- C. Class D with redundant conductors run in separate raceways throughout the circuit
- D. Class C with isolation modules installed at every fifth device on the circuit

34. When a fire alarm system's primary AC power fails, NFPA 72 requires the secondary batteries to power the system for a minimum of 24 hours in standby. What additional alarm operation time is required at the end of the standby period under the default requirement?

- A. 15 minutes of alarm at full system load after the 24-hour standby period
- B. 10 minutes of alarm at full system load after the 24-hour standby period
- C. 5 minutes of alarm at full system load after the 24-hour standby period
- D. 30 minutes of alarm at full system load after the 24-hour standby period

35. A fire alarm technician is installing devices in a building with a suspended ceiling. All above-ceiling rough-in work must be completed before which construction milestone?

- A. Before the HVAC system is started up and the air handling units are operational
- B. Before the electrical contractor energizes the building's main distribution panel
- C. Before the general contractor issues the notice of substantial completion
- D. Before the ceiling tiles are installed so that all concealed work is accessible for inspection

36. What is the primary reason that fire alarm circuit conductors must be separated from building power conductors per NEC Article 760?

- A. To prevent induced voltages from power circuits that could cause interference or false signals
- B. To allow fire alarm circuits to operate at higher voltages without affecting building power
- C. To ensure that power circuit breakers do not inadvertently disconnect fire alarm wiring
- D. To comply with the panel manufacturer's warranty requirements for listed installations

37. A fire alarm system has a total standby current of 0.4 amps and a total alarm current of 3.5 amps. Using the standard NFPA 72 requirement of 24 hours standby and 5 minutes alarm with a 20% safety factor, what is the minimum required battery capacity?

- A. 9.6 ampere-hours without applying any safety factor to the calculation
- B. 15.2 ampere-hours using a 10% safety factor instead of the required 20%
- C. 11.87 ampere-hours after applying the required 20% safety factor to the total
- D. 24.0 ampere-hours based on the standby current multiplied by standby duration only

38. A fire alarm technician must verify that a newly installed notification appliance circuit does not exceed the panel's NAC output capacity. The panel's NAC output is rated at 2.5 amps. The circuit has 8 horn/strobes that each draw 0.285 amps in alarm. What is the total circuit load?

- A. The total is over the rated capacity and the circuit must be redesigned
- B. 2.28 amps which is within the 2.5-amp NAC output rating
- C. The total equals exactly 2.5 amps which meets the output capacity
- D. 2.85 amps which exceeds the rated output by a significant margin

39. A fire alarm technician is terminating conductors at a junction box using wire nuts. After connecting the conductors, what additional step should be performed to verify the connection integrity?

- A. Perform a tug test on each wire nut connection to verify it is mechanically secure
- B. Apply electrical tape around the wire nut to provide additional insulation protection
- C. Measure the voltage at the wire nut junction to confirm continuity through the splice
- D. Label each wire nut with the circuit identification number for future reference

40. What type of fire alarm cable is permitted in ALL installation locations regardless of whether the space is a plenum, riser, or general-purpose area?

- A. FPL cable which is the base-level fire alarm cable for general-purpose areas
- B. FPLR cable which is rated for both riser and general-purpose applications
- C. THHN conductors installed in conduit which satisfies all location requirements
- D. FPLP cable which has the highest fire rating and can substitute for all lower ratings

41. A fire alarm technician is installing addressable smoke detectors using a twist-lock base configuration. What advantage does this mounting method provide?

- A. It eliminates the need for an electrical box behind the detector mounting location
- B. It allows the detector head to be removed for maintenance without disturbing the wiring
- C. It increases the detector's sensitivity by providing an air gap behind the sensing element
- D. It permits multiple detector heads to be installed on a single base for redundant detection

42. Which of the following is the correct method for measuring DC voltage on a fire alarm notification appliance circuit?

- A. Connect the multimeter leads in series with the circuit and set the meter to DC amps
- B. Set the meter to AC volts and connect the leads across the circuit under test
- C. Set the meter to DC volts and connect the leads across the circuit in parallel
- D. Set the meter to resistance and connect the leads to the panel's NAC terminals

43. A fire alarm system's secondary power batteries must be capable of automatic recharging when primary AC power is restored. Who provides the battery charging function?

- A. An external standalone battery charger installed adjacent to the fire alarm panel

- B. The building's emergency generator through a dedicated charging circuit
- C. The supervising station through a remote power management connection
- D. The fire alarm control unit through its internal power supply and charging circuitry

44. During installation, a fire alarm technician notices that a sprinkler contractor has installed piping that blocks the planned location for a smoke detector on the ceiling. What is the correct first action?

- A. Document the conflict and report it to the supervisor before relocating the detector
- B. Move the detector to the nearest available ceiling location that appears suitable
- C. Request that the sprinkler contractor relocate their piping to accommodate the detector
- D. Install the detector on the sprinkler pipe using an approved pipe-mounting bracket

45. Per OSHA construction safety standards, a fire alarm technician working from a stepladder should never stand on which portion of the ladder?

- A. Any rung above the midpoint of the ladder to maintain a low center of gravity
- B. The top two rungs of the stepladder to prevent tipping and loss of balance
- C. Any rung unless the ladder is secured to the structure with a tie-off strap
- D. The bottom rung of the stepladder because it may flex under body weight

46. A fire alarm technician is installing cable in a building. The NEC requires that fire alarm conductors be identified at terminal and junction locations. Which of the following methods satisfies this requirement?

- A. Using only red-jacketed cable for all fire alarm circuits throughout the building
- B. Storing the cable identification information in the panel's programming database
- C. Color coding, tagging, or other permanent marking that distinguishes fire alarm wiring
- D. Verbal notification to the electrical contractor that fire alarm circuits are present

DOMAIN 1.2 — MAINTENANCE (Questions 47–82)

47. A fire alarm technician is preparing to perform functional testing on a fire alarm system in an occupied office building. What is the first action before beginning any device testing?

- A. Notify the supervising station that the system is being placed on test status
- B. Evacuate all building occupants before activating any initiating devices
- C. Disconnect all notification appliance circuits to prevent alarm sounds
- D. Reset the fire alarm panel to clear any existing alarm or trouble conditions

48. Per NFPA 72 Table 14.4.3.2, heat detectors of the restorable type must be functionally tested at what frequency?

- A. Semiannually using a calibrated heat source applied to the sensing element
- B. Quarterly using a calibrated heat source at 50% of the rated activation temperature
- C. Monthly using visual inspection only since heat detectors cannot be functionally tested
- D. Annually using a calibrated heat source applied to the sensing element

49. During periodic testing, a fire alarm technician activates a pull station and the panel displays the correct alarm. However, the technician notices that the alarm signal was not transmitted to the supervising station. What is the most likely issue?

- A. The pull station has an internal fault that prevents signal transmission
- B. The communication path between the panel and supervising station has a fault
- C. The panel's NAC circuits are overloaded and preventing signal processing
- D. The pull station is not listed for use with the installed communication module

50. A fire alarm technician is performing a visual inspection of smoke detectors throughout a building. Which of the following conditions would be documented as a deficiency during the visual inspection?

- A. A smoke detector with construction dust visibly accumulated on the exterior housing
- B. A smoke detector with the manufacturer's model number label slightly faded from age
- C. A smoke detector that is securely mounted to the ceiling with the twist-lock base engaged
- D. A smoke detector located in the center of a room at standard 30-foot spacing intervals

51. A fire alarm system's event log shows that the panel has been generating a "Ground Fault — SLC 1" trouble signal intermittently over the past month. What environmental condition most commonly causes this type of intermittent fault?

- A. Temperature fluctuations that cause the SLC conductors to expand and contract
- B. Electromagnetic interference from nearby variable frequency drive motor controllers
- C. Moisture infiltrating a junction box or device location and compromising insulation
- D. Voltage fluctuations on the primary AC power supply affecting panel operation

52. Per NFPA 72, what is the required secondary power supply duration for a fire alarm system that includes an emergency voice/alarm communication system?

- A. 12 hours of standby followed by 5 minutes of alarm at full system load
- B. 24 hours of standby followed by 5 minutes of alarm at full system load
- C. 48 hours of standby followed by 30 minutes of alarm at full system load
- D. 24 hours of standby followed by 15 minutes of alarm at full system load

53. A fire alarm technician tests a horn/strobe combination device during annual testing. The horn produces sound but the strobe does not flash. The technician measures 22 VDC at the device terminals. What should the technician conclude?

- A. The voltage is too low for the strobe component and the wire gauge must be increased
- B. The visible component has likely failed and the device should be replaced
- C. The panel programming has disabled the strobe output for this specific device
- D. The NAC circuit polarity is reversed preventing the strobe from operating correctly

54. During acceptance testing of a fire alarm system, the AHJ requires that elevator recall be tested. What must the technician verify during this test?

- A. The elevators travel to the designated recall floor, open their doors, and leave normal service
- B. The elevators remain at their current floor and lock their doors in the closed position
- C. The elevators travel to the top floor of the building and park with doors closed
- D. The elevators continue normal operation until a second alarm confirmation is received

55. A fire alarm technician is conducting a battery inspection and notices that one of the two 12-volt batteries in a 24-volt system has a slightly bulging case. What action is required?

- A. Monitor the battery for one week and replace it if the bulging increases noticeably
- B. Recharge the battery fully and recheck the case condition after 24 hours of charging
- C. Replace both batteries immediately because bulging indicates internal cell degradation
- D. Replace only the bulging battery and leave the other battery in service until testing

56. Per NFPA 72, the fire alarm panel must annunciate a trouble signal for loss of primary AC power within what maximum time frame?

- A. Immediately upon detection of any primary power interruption lasting over 1 second

- B. Within 30 minutes of sustained primary AC power loss to the fire alarm panel
- C. Within 60 minutes of sustained primary AC power loss to the fire alarm panel
- D. Within 3 hours of primary AC power loss to prevent nuisance trouble signals

57. A fire alarm technician discovers during annual testing that a duct smoke detector fails to activate when tested with approved aerosol smoke. What should the technician do?

- A. Adjust the detector sensitivity threshold to its maximum setting and retest
- B. Document the failure, take the device out of service, and schedule repair or replacement
- C. Bypass the duct detector in the panel programming until a replacement unit arrives
- D. Clean the detector's sampling tubes and retest before documenting any deficiency

58. When testing the primary-to-secondary power transfer on a fire alarm panel, the technician disconnects AC power. The panel fails to transfer to battery power and shuts down completely. What is the most likely cause?

- A. The primary power circuit breaker has a lock-on device preventing complete disconnection
- B. The panel's internal transfer relay is stuck in the primary power position
- C. The batteries are dead, disconnected, or have failed to maintain adequate charge
- D. The panel must be manually switched to battery mode using a front-panel toggle

59. Per NFPA 72, sensitivity testing of smoke detectors can be accomplished on analog addressable systems by which method?

- A. Reviewing the panel's sensitivity reports that show each detector's analog readings and drift
- B. Removing each detector from its base and testing it in a calibrated smoke tunnel
- C. Activating each detector with aerosol smoke and measuring the response time in seconds
- D. Replacing each detector with a factory-calibrated unit on a rotating 5-year schedule

60. During a fire alarm inspection, the technician discovers that the panel's Record of Completion is missing from the building's fire alarm documentation. Why is this significant?

- A. The Record of Completion is only required for systems installed after 2020
- B. The missing document affects only the insurance coverage and not code compliance
- C. The Record of Completion is optional documentation that supplements the as-built drawings
- D. The Record of Completion is a code-required document that certifies system compliance

61. A fire alarm technician is troubleshooting a notification appliance circuit that shows a trouble condition. The technician measures the voltage at the panel's NAC output terminals and reads 0 VDC. All other panel circuits appear normal. What is the most likely cause?

- A. The NAC output on the panel is operating normally because NACs are de-energized in standby
- B. The NAC output circuit board or fuse on the panel has failed and requires replacement
- C. The end-of-line resistor on the NAC is missing causing the panel to shut down the output
- D. The panel programming has not assigned any devices to the NAC output circuit

62. A fire alarm system generates a trouble signal indicating "SLC Communication Failure — Device 047." In an addressable system, what does this mean?

- A. Device 047 has stopped responding to the panel's polling commands on the SLC
- B. The entire SLC loop has lost communication with all devices on the circuit
- C. Device 047 is transmitting an alarm signal that the panel cannot process correctly
- D. The SLC circuit has an open fault at the physical location of Device 047

63. What is the purpose of the 20% safety factor applied to fire alarm battery capacity calculations?

- A. To provide capacity for testing the batteries under load during semiannual inspections

- B. To allow the batteries to power additional future devices added to the fire alarm system
- C. To account for battery aging, temperature effects, and manufacturing tolerances over time
- D. To ensure the batteries can power the system for 48 hours instead of the standard 24 hours

64. A fire alarm technician is testing visible notification appliances in a corridor. Two strobes are visible from the same location. What must the technician verify about their operation?

- A. Each strobe must flash at a different rate so occupants can distinguish between zones
- B. Both strobes must produce identical candela output regardless of room size differences
- C. Both strobes must be mounted at exactly the same height within a tolerance of 1 inch
- D. Both strobes must flash in synchronization to prevent a disorienting visual effect

65. During annual testing, a fire alarm technician activates a smoke detector in an addressable system. The panel displays "ALARM — SMOKE DETECTOR — ADDRESS 031 — MECHANICAL ROOM." The technician is testing a detector in a conference room, not the mechanical room. What is the most likely cause?

- A. The device location descriptor in the panel programming is incorrect for that address
- B. The SLC has a wiring fault that is cross-connecting signals between two circuits
- C. The smoke detector hardware is defective and transmitting the wrong address code
- D. The panel software has corrupted the device database and must be completely reprogrammed

66. Per NFPA 72 Table 14.4.3.2, how frequently must waterflow switches on sprinkler systems be functionally tested?

- A. Monthly by flowing water through the inspector's test connection point
- B. Semiannually by flowing water through the inspector's test connection point
- C. Annually by flowing water through the inspector's test connection point
- D. Quarterly by flowing water through the inspector's test connection point

67. A fire alarm technician is troubleshooting a conventional fire alarm system where Zone 2 is showing a persistent trouble signal. The technician disconnects the wiring at the panel for Zone 2 and the trouble signal clears. What does this confirm?

- A. The fire alarm control panel has a defective zone input circuit board for Zone 2
- B. The trouble originates from a programming error in the Zone 2 configuration settings
- C. The fault is located somewhere on the Zone 2 field wiring or connected devices
- D. The panel's power supply is insufficient to supervise Zone 2 during normal operation

68. Which of the following methods is prohibited for testing smoke detectors during periodic functional tests?

- A. Using a listed aerosol smoke product specifically manufactured for detector testing
- B. Using a calibrated smoke generator designed for fire alarm testing applications
- C. Using the detector's built-in magnetic test switch to simulate an alarm condition
- D. Using an open flame or match held near the detector to produce actual combustion smoke

69. A fire alarm technician is reviewing the results of a battery load test. The battery set started at 26.4 VDC and dropped to 24.8 VDC under full alarm load after the required test duration. What do these results indicate?

- A. The batteries passed the load test and are maintaining adequate voltage under load
- B. The batteries failed because the starting voltage exceeds the nominal system rating
- C. The batteries require immediate replacement because any voltage drop is unacceptable
- D. The test results are inconclusive and the test must be repeated with a higher load

70. A building owner reports that smoke detectors in the parking garage are generating frequent nuisance alarms. What is the most likely environmental cause?

- A. Temperature variations between indoor and outdoor air cause humidity fluctuations
- B. Vehicle exhaust fumes entering the detector sensing chambers trigger false activations
- C. Wind from the garage ventilation system creates air pressure changes at the detectors
- D. Electromagnetic interference from vehicle ignition systems affects detector electronics

71. Per NFPA 72, when a significant fire alarm system impairment exists, which compensatory measure may be required until the system is restored?

- A. Reducing building occupancy to 50% of the maximum permitted occupant load
- B. Posting signs at all building entrances notifying occupants of the impaired system
- C. Activating the building's emergency generator to provide supplemental power
- D. Establishing a fire watch with trained personnel patrolling the impaired areas

72. A fire alarm technician tests the HVAC shutdown interface during annual testing. The technician activates a duct smoke detector, but the associated air handling unit continues to operate. What should be documented?

- A. The test is acceptable because duct detectors do not directly control HVAC equipment
- B. The AHU delay timer has not expired and the unit will shut down after a preset time
- C. The HVAC shutdown interface has failed and must be investigated and repaired
- D. The duct detector is functioning correctly but the AHU is on a separate control system

73. During an inspection, the fire alarm technician notices that the fire alarm panel's AC power indicator is off while the battery indicator shows the system is operating on secondary power. The building has normal utility power. What is the most likely cause?

- A. The panel's internal power supply has failed and is not converting AC to DC properly
- B. The dedicated branch circuit breaker has tripped or been turned off at the distribution panel
- C. The building's electrical system has a phase imbalance affecting only the fire alarm circuit
- D. The panel is performing an automatic battery test cycle that temporarily disconnects AC power

74. A fire alarm technician is documenting the results of annual inspection and testing. Per NFPA 72, which of the following must be included in the test records?

- A. The date, technician name, service company, devices tested, and results for each device
- B. Only the overall pass or fail result for the entire system with the technician signature
- C. Only the devices that failed testing with a description of the corrective action taken
- D. The building owner's signature acknowledging that testing was performed on the premises

75. Which of the following statements about the NICET Code of Ethics is correct?

- A. The Code of Ethics applies only during the examination and is not enforceable afterward
- B. Certified technicians may share general exam topic areas with candidates preparing for tests
- C. The Code of Ethics is a voluntary guideline that certified technicians should aspire to follow
- D. Sharing exam content violates the NDA and the Code of Ethics and may result in sanctions

76. A fire alarm technician measures 28.1 VDC at the panel's battery terminals with the charger connected and the system in normal standby. Is this reading acceptable?

- A. No, this voltage is dangerously high and indicates the charger is overcharging the batteries

- B. No, this voltage should be exactly 24.0 VDC with no deviation above nominal system voltage
- C. Yes, this is a normal float charge voltage for a 24 VDC sealed lead-acid battery system
- D. Yes, but only if the building's primary AC voltage is also reading above its nominal value

77. During a functional test, the technician activates a pull station and verifies that the panel receives the alarm. However, only the horn/strobes on the same floor activate. The sequence of operations requires all floors to receive notification. What is the most likely cause?

- A. The pull station is generating a supervisory signal rather than a full alarm signal
- B. The panel programming does not correctly assign all notification zones to that input
- C. The NAC circuits on the other floors have open faults preventing appliance activation
- D. The pull station model is incompatible with the panel's input processing requirements

78. A fire alarm technician finds that a building's fire alarm system has not had smoke detector sensitivity testing performed for three years. The system was installed five years ago. How many sensitivity tests should have been completed by this point per NFPA 72?

- A. Three tests — one within the first year, then at year three and year five
- B. Two tests — one within the first year and one at year three only
- C. Five tests — one annually since the detectors were originally installed
- D. One test — only the initial test within the first year after installation

79. A conventional fire alarm panel shows "ALARM — ZONE 3" but no devices on Zone 3 were intentionally activated. The technician measures the resistance at the Zone 3 panel terminals and reads 0.5 ohms. What condition is indicated?

- A. An open circuit on Zone 3 caused by a broken conductor near the panel connection
- B. The Zone 3 end-of-line resistor has drifted to a value below the panel's normal range
- C. A ground fault on the Zone 3 circuit is causing false voltage readings at the terminals

D. A short circuit on Zone 3 is being interpreted by the panel as a device activation

80. A fire alarm system installed in a building with a qualifying emergency generator may have its secondary battery standby requirement reduced from 24 hours to what duration per NFPA 72?

A. 12 hours of standby when the generator provides automatic transfer within 30 seconds

B. 8 hours of standby when the generator has a minimum fuel capacity of 48 hours

C. 4 hours of standby when the generator meets the specific reliability criteria in NFPA 72

D. 2 hours of standby when the generator is tested monthly per the maintenance schedule

81. During testing, a fire alarm technician discovers that the fire alarm panel's event history log is full and can no longer record new events. What is the significance of this finding?

A. The log should be printed or downloaded and then cleared to restore event recording capability

B. A full event log has no significance because the panel continues to function normally

C. The panel must be completely replaced because event log memory cannot be expanded

D. The event log automatically overwrites the oldest entries and requires no technician action

82. A fire alarm technician is testing the supervising station communication link. After transmitting a test alarm signal, the technician calls the supervising station to verify receipt. The station confirms they received a trouble signal instead of an alarm. What does this indicate?

A. The supervising station's receiving equipment misidentified the signal format

B. The communication module or panel programming is transmitting the wrong signal type

C. The telephone line has excessive noise that is corrupting the transmitted signal data

D. The test was successful because trouble and alarm signals use the same transmission format

DOMAIN 1.3 — SUBMITTAL PREPARATION AND SYSTEM LAYOUT (Questions 83–85)

83. A fire alarm device schedule is a document that lists each device by which of the following information categories?

- A. The device manufacturer, purchase date, warranty expiration, and replacement cost
- B. The building's occupancy type, construction class, and fire protection features
- C. The circuit voltage, conductor size, conduit type, and raceway fill percentage
- D. The device address, type, location description, circuit assignment, and zone designation

84. When fire alarm shop drawings are submitted to the design engineer for review and returned marked "Revise and Resubmit," what does this disposition require?

- A. The drawings are approved for construction with only minor administrative corrections
- B. The contractor may begin installation while making the noted corrections simultaneously
- C. The drawings require no changes and are being returned for the contractor's records
- D. Significant corrections are required and the drawings must be revised and submitted again

85. A fire alarm voltage drop calculation determines that the voltage at the farthest notification appliance on a circuit will be 14.8 VDC. The appliances are listed for operation between 16 and 33 VDC. What must the designer do?

- A. Proceed with the installation since the voltage is within an acceptable tolerance range
- B. Add a 10% safety factor to the calculation which will bring the voltage above 16 VDC
- C. Redesign the circuit using larger conductors, shorter runs, or fewer appliances per circuit
- D. Request a variance from the manufacturer to operate the appliances below listed voltage

LEVEL I — SIMULATION EXAM 2: ANSWER KEY AND EXPLANATIONS

1. D — FPLR (Fire Power-Limited Riser) cable is the minimum requirement for vertical runs that pass through more than one floor. FPLR cable resists flame propagation along vertical cable runs, preventing fire from traveling between floors via the cable pathway. NEC Section 760.176 establishes the cable hierarchy — FPLP can substitute for FPLR, but FPL cannot be used in riser applications.
2. B — Corroded battery terminals create high-resistance connections that impair the battery's ability to deliver current when needed. Cleaning the corrosion before making the connection ensures a solid, low-resistance contact that allows full current flow during a power transfer event. Corroded terminals are a common cause of failed primary-to-secondary power transfers during actual power outages.
3. A — NFPA 72 Section 17.7.3.2.1 permits smoke detectors to be wall-mounted as an alternative to ceiling mounting, provided the top of the detector is within 12 inches of the ceiling. This placement keeps the detector within the smoke layer that accumulates near the ceiling surface while accommodating installations where ceiling mounting is impractical.
4. C — NFPA 72 Section 17.6.3.1.3 requires heat detectors to be rated at least 20°F above the maximum expected ambient temperature to prevent nuisance activations from normal temperature variations. In a kitchen with 115°F ambient temperatures, the minimum acceptable detector rating would be 135°F. This thermal margin ensures the detector responds only to abnormal fire-related temperature increases.
5. A — NEC allows a maximum of 360 degrees of bends between pull points. Two 90-degree bends (180°) plus one 45-degree bend (45°) equals 225 degrees, leaving 135 degrees remaining (360 – 225 = 135). This remaining allowance could accommodate one more 90-degree bend plus one 45-degree bend before a pull box is required.
6. D — NEC Article 760 and NFPA 72 Section 10.6.5 require that the fire alarm panel's dedicated branch circuit be permanently and distinctively marked at the electrical distribution panel. This identification ensures that anyone working at the panel board can immediately identify the fire alarm circuit and avoid inadvertently disconnecting it during routine electrical maintenance.
7. B — A monitor module is an addressable device that accepts a conventional contact input — such as a waterflow switch, tamper switch, or relay contact — and reports the device's status to the fire alarm control panel over the signaling line circuit. This allows conventional devices to be

individually identified within an addressable system architecture. Control modules perform the opposite function, receiving commands and activating outputs.

8. B — NEC Annex C, Table C1 provides pre-calculated maximum conductor counts for EMT conduit organized by conductor size and insulation type. Table C1 eliminates the need for manual calculation — locate the conductor type and size in the left column, read across to the conduit size, and the intersection gives the maximum number of conductors permitted.
9. C — OSHA 29 CFR 1926 Subpart M requires fall protection for construction workers at heights of 6 feet or more above a lower level. At 8 feet, the technician is above the 6-foot threshold and must use fall protection such as guardrails, safety nets, or a personal fall arrest system. This requirement applies to all construction activities regardless of trade or perceived risk level.
10. A — In a Class B circuit configuration, a single open fault breaks the only path between the panel and the devices beyond the fault. All appliances between the panel and the break continue to operate, but all appliances beyond the break are isolated and will not receive power during an alarm. This is the fundamental limitation of Class B wiring compared to Class A, which maintains communication through an alternate path.
11. D — A ground-fault circuit interrupter (GFCI) is specifically prohibited on the fire alarm panel's dedicated branch circuit. GFCIs can trip during ground fault conditions that do not represent a fire hazard, disconnecting primary power from the fire alarm panel and leaving the building without its primary power source. NEC Section 760.41 and NFPA 72 Section 10.6.5 establish this prohibition. AFCI devices are similarly prohibited.
12. C — NEC Section 760.136 requires that power-limited fire alarm circuits be separated from electric light, power, and Class 1 circuits. PLFA conductors cannot share raceways, boxes, or enclosures with power conductors unless specific exceptions are met, such as a permanent barrier within the raceway. This separation prevents induced voltages that could cause communication errors or nuisance alarms on fire alarm circuits.
13. A — Before pulling wire, the technician must verify that the conduit run is clear of debris, obstructions, and sharp edges. All conduit cuts must be deburred to remove metal burrs that could scrape and damage conductor insulation during the pull. Damaged insulation can cause ground faults, short circuits, and intermittent trouble conditions that are difficult to locate after installation is complete.
14. A — An addressable fire alarm system assigns a unique electronic address to each device on the signaling line circuit, allowing the panel to individually identify and communicate with every detector, module, and monitor point. This provides point-level identification of alarm, trouble, and supervisory conditions — a significant advantage over conventional systems that identify only the zone.

15. B — NEC Section 760.136 prohibits power-limited fire alarm conductors from sharing raceways with power conductors except under specific limited conditions. The fire alarm conductors must be removed and reinstalled in a separate dedicated raceway. Simply adding a barrier inside an existing conduit is not a standard or practical field remedy and may not meet the specific NEC exceptions.
16. D — Photoelectric smoke detectors use a light-scattering principle. A light source and photosensitive receiver are positioned at an angle inside the sensing chamber so that under normal conditions, the light does not reach the receiver. When smoke particles enter the chamber, they scatter the light beam onto the receiver, and when the light level exceeds a set threshold, the detector activates.
17. C — NEC Article 760 requires that fire alarm cable in exposed locations subject to physical damage be installed in a raceway for protection. Any cable installed less than 7 feet above the floor in an area where it could be contacted by equipment, materials, or personnel is considered exposed to physical damage and must be protected by conduit or another approved raceway.
18. A — In a Class B initiating device circuit, the end-of-line resistor is installed at the last device on the circuit. The EOLR provides the reference resistance that the panel monitors for circuit supervision. If the circuit opens (resistance goes to infinity) or shorts (resistance drops to near zero), the panel detects the change from the expected EOLR value and generates a trouble signal.
19. B — NFPA 72 Section 17.14 requires manual fire alarm stations to be installed within 5 feet of each exit doorway, mounted at a height between 42 and 48 inches above the finished floor measured to the handle or operating mechanism. This placement ensures the device is located where evacuating occupants naturally pass and is at an accessible height for adults and wheelchair users.
20. D — When two equal resistors are connected in parallel, the total equivalent resistance is half the value of either individual resistor. For two 470-ohm resistors in parallel: $R_{\text{total}} = (470 \times 470) / (470 + 470) = 220,900 / 940 = 235$ ohms. This is a frequently tested calculation that uses the simplified parallel resistance formula $R_{\text{total}} = R / 2$ for equal resistors.
21. D — When the ceiling space has a ducted return air system and is not used for air handling, the space is not classified as a plenum. FPL (general purpose), FPLR (riser), or FPLP (plenum) cable are all acceptable for this installation. The plenum rating (FPLP) is only required when the ceiling space is actively used as a return air plenum — which is not the case with a dedicated ducted return system.
22. B — Using Ohm's Law ($I = V / R$), current equals voltage divided by resistance: $I = 24V / 8\Omega = 3$ amps. This is one of the most fundamental electrical calculations in fire alarm work. Ohm's Law is used daily for circuit analysis, voltage drop calculations, and troubleshooting, and it appears frequently on the NICET exam at all levels.

23. C — A tamper switch on a sprinkler control valve generates a supervisory signal — not an alarm signal — when the valve is moved from its normal fully open position. Supervisory signals indicate that fire protection equipment is in an off-normal state that could impair its effectiveness. Smoke detectors and waterflow switches generate alarm signals; tamper switches generate supervisory signals.
24. A — A resistance reading of 0.2 ohms between the two conductors at the panel end — with no devices connected and no EOLR installed — indicates normal conductor resistance for the circuit length. This low resistance confirms that the conductors are continuous from one end to the other with good connections. The actual value depends on wire gauge and circuit length but should be very low for properly installed copper conductors.
25. B — Notification appliance circuits commonly use 14 AWG conductors because NACs carry higher current during alarm than signaling circuits. The 14 AWG size provides adequate ampacity for typical NAC loads and acceptable voltage drop performance for moderate circuit lengths. Longer runs or higher current loads may require 12 AWG to keep voltage drop within listed appliance operating ranges.
26. D — NFPA 72 Section 17.7.3.2.3 requires smoke detectors on sloped or peaked ceilings to be installed within 3 feet of the peak, measured horizontally from the highest point. Smoke rises along the ceiling slope and accumulates at the peak first, so positioning the detector within 3 feet of this collection point ensures the earliest possible detection.
27. C — A near-zero ohms reading at the IDC terminals indicates a short circuit — the two conductors are making contact somewhere on the circuit, bypassing the normal circuit resistance including the EOLR. Depending on the panel design, a short circuit may be interpreted as a trouble condition or an alarm condition. An open circuit would read infinite ohms, and a normal circuit would read the EOLR value.
28. A — The minimum standard PPE for fire alarm technicians on a construction site includes a hard hat for overhead protection, safety glasses with side shields for eye protection, safety-toed footwear for foot protection, and work gloves appropriate for the task being performed. Additional PPE may be required based on specific hazards present, but these four items are the baseline minimum per OSHA construction safety standards.
29. C — Photoelectric smoke detectors respond fastest to slow-smoldering fires that produce large, visible smoke particles. The large particles scatter light effectively within the photoelectric sensing chamber, triggering the alarm before the fire transitions to open flame. Ionization detectors respond faster to fast-flaming fires with small invisible particles, while photoelectric excels at the smoldering fire profile.
30. B — A tone generator and amplifier probe set is used to identify and trace individual wires within a cable bundle, conduit, or raceway. The tone generator injects a signal onto one end of a specific conductor, and the amplifier probe detects that signal at the other end, identifying the correct wire

from among multiple similar conductors. This tool is essential for wire identification during installation and troubleshooting.

31. A — Voltage drop is calculated using $V_{\text{drop}} = I \times R_{\text{wire}}$. With 2 amps of total current and 1.57 ohms of round-trip wire resistance: $V_{\text{drop}} = 2 \times 1.57 = 3.14$ volts. The voltage at the farthest appliance would be $24 - 3.14 = 20.86$ VDC. This is above the typical 16 VDC minimum for listed 24 VDC notification appliances, so the circuit is acceptable.
32. D — The correct OSHA lockout/tagout sequence requires shutting down the equipment, isolating all energy sources, applying lockout devices and tags to the energy isolation points, and then verifying de-energization with a properly rated voltage tester before beginning work. Verification is the critical final step — a lockout device prevents re-energization but does not confirm that the equipment is actually de-energized.
33. B — Class A wiring provides the highest fault tolerance by routing conductors in a loop that leaves the panel and returns via a separate pathway. If a single open fault occurs anywhere on the loop, signals can still reach all devices through the alternate path. Class B circuits lose all devices beyond a single open fault because there is only one path for communication.
34. C — The default NFPA 72 secondary power requirement is 24 hours of standby followed by 5 minutes of alarm operation at full system load. This ensures the fire alarm system remains fully operational through an extended power outage and can still deliver complete alarm notification at the end of that period. Extended alarm durations apply to voice evacuation and other special system types.
35. D — All above-ceiling fire alarm rough-in — conduit, junction boxes, cable, and device backboxes — must be completed and inspected before the ceiling tiles are installed. Once the ceiling grid is closed, concealed work is inaccessible for inspection and extremely difficult to modify. Coordinating the completion of above-ceiling work with the ceiling contractor's schedule is a critical project management responsibility.
36. A — The primary reason for separating fire alarm circuits from building power circuits is to prevent induced voltages from the higher-voltage power conductors from interfering with the low-voltage fire alarm signals. Electromagnetic interference from power circuits can cause communication errors on SLC circuits, false readings on IDC circuits, and unreliable device operation that compromises the fire alarm system's detection and notification capability.
37. C — Battery capacity = $[(I_{\text{standby}} \times T_{\text{standby}}) + (I_{\text{alarm}} \times T_{\text{alarm}})] \times 1.20$. Standby energy = $0.4 \times 24 = 9.6$ Ah. Alarm energy = $3.5 \times 0.083 = 0.29$ Ah. Subtotal = 9.89 Ah. With 20% safety factor: $9.89 \times 1.20 = 11.87$ Ah. The minimum battery capacity is 11.87 ampere-hours — select the next available standard battery size above this value.
38. B — Total circuit load = $8 \text{ devices} \times 0.285 \text{ amps} = 2.28$ amps. The panel's NAC output is rated at 2.5 amps, so 2.28 amps is within the rated capacity with 0.22 amps of margin remaining. The

circuit loading is acceptable, but the margin is relatively small — adding even one more device at the same current draw would bring the total to 2.565 amps, exceeding the output rating.

39. A — After making wire nut connections, the technician must perform a tug test on each connection by gently pulling on each conductor to verify the wire nut is securely fastened. A loose wire nut can vibrate free over time, creating an open circuit that generates trouble signals or prevents alarm signal transmission. The tug test is a simple but critical quality verification step.
40. D — FPLP (Fire Power-Limited Plenum) cable has the highest fire rating in the fire alarm cable hierarchy and can be used in any installation location — plenum spaces, riser applications, and general-purpose areas. It can always substitute downward for FPLR or FPL, but neither FPLR nor FPL can substitute upward for FPLP in plenum-rated spaces.
41. B — The twist-lock base configuration allows the smoke detector head to be removed from its base for cleaning, sensitivity testing, or replacement without disturbing the wiring connections at the base. The base remains permanently wired to the circuit, and the detector head simply twists in and out. This design simplifies maintenance and reduces the risk of disturbing circuit connections during service activities.
42. C — To measure DC voltage on a fire alarm circuit, set the multimeter to DC volts and connect the test leads across the circuit in parallel — positive lead to the positive conductor and negative lead to the negative conductor. Measuring with the meter set to AC volts would produce an inaccurate reading, and connecting in series would interrupt the circuit and attempt to measure current instead.
43. D — The fire alarm control unit's internal power supply includes battery charging circuitry that automatically recharges the secondary batteries when primary AC power is available. The charger maintains the batteries at their float charge voltage during normal operation and recharges them after a discharge event. No external charger is required — the charging function is built into the FACU.
44. A — When a field conflict prevents a device from being installed at its planned location, the technician must document the conflict and report it to the supervisor or project manager before making any changes. Relocating a detector without authorization may violate the approved shop drawings, affect spacing compliance, or require engineering review. Changes must be approved and documented before implementation.
45. B — OSHA prohibits standing on the top two rungs of a stepladder because the elevated center of gravity creates an unstable condition that significantly increases the risk of tipping and falling. The top cap and the rung immediately below it are not designed as standing surfaces. Workers must maintain three points of contact and keep their body centered between the ladder's side rails.
46. C — NEC Section 760.24 requires that fire alarm circuit conductors be identified at terminal and junction locations through color coding, tagging, or other permanent marking methods. This

identification distinguishes fire alarm wiring from other building wiring systems and prevents inadvertent disconnection during maintenance. Verbal notification and digital records alone do not satisfy the physical identification requirement.

47. A — Before beginning any functional testing, the technician must notify the supervising station that the system is being placed on test status. This prevents false alarm dispatches during testing activities that would trigger unnecessary fire department response. After testing is complete, the supervising station must be notified that the system is returning to normal service.
48. D — NFPA 72 Table 14.4.3.2 requires restorable heat detectors to be functionally tested annually using a calibrated heat source applied to the detector's sensing element. The technician applies heat until the detector activates, then verifies that the panel receives the correct alarm signal for that device or zone. Annual testing ensures the detector's thermal sensing mechanism remains responsive.
49. B — When the panel displays the correct alarm but the signal is not received at the supervising station, the communication path between the panel and the station has a fault. The panel processed the alarm correctly from the initiating device, but the signal failed to transmit. Causes include a failed communicator module, a disconnected telephone line, a network outage, or a cellular signal loss.
50. A — Visible construction dust accumulated on a smoke detector exterior is a deficiency that must be documented during visual inspection. Dust accumulation can enter the sensing chamber and cause nuisance alarms or, if severe enough, impair the detector's ability to sense actual smoke. The condition indicates the detector may need cleaning or protective covering during ongoing construction.
51. C — Moisture infiltrating a junction box, device location, or conduit creates an intermittent low-resistance path between a conductor and ground. As humidity and moisture levels fluctuate — due to rain, temperature cycling, condensation, or plumbing leaks — the ground fault appears and disappears. Moisture-related ground faults are among the most common causes of intermittent trouble signals on fire alarm circuits.
52. D — Emergency voice/alarm communication systems require an extended secondary power duration of 24 hours of standby followed by 15 minutes of alarm operation — three times the standard 5-minute alarm requirement. This extended alarm duration ensures the voice system can deliver sustained voice communication during an extended emergency in a high-rise or complex building.
53. B — With 22 VDC at the device terminals — which is within the typical 16–33 VDC operating range for 24 VDC appliances — the voltage is adequate for both components. Since the horn operates but the strobe does not, the most likely cause is a failure of the visible component within the device itself. The combination device should be replaced and the new unit tested to verify both audible and visible operation.

54. A — Elevator recall testing verifies that when smoke detection activates in elevator lobbies, hoistways, or machine rooms, all elevators travel to the designated recall floor (typically the ground floor), open their doors, and are removed from normal service. This is Phase I recall per NFPA 72 Section 21.3. The elevators must not continue normal operation or travel to any floor other than the designated recall floor.
55. C — A bulging battery case indicates internal cell degradation — typically from overcharging, overheating, or age-related chemical breakdown. Both batteries should be replaced as a set because batteries in a series pair should always be the same age and condition. Leaving a degraded battery in service risks a system failure during a power outage when the batteries are needed most.
56. D — NFPA 72 Section 10.6.9 permits a delay of up to 3 hours before annunciating an AC power failure trouble signal. This delay prevents nuisance trouble signals during brief power interruptions such as momentary outages, utility switching events, and short-duration power dips. The 3-hour window allows normal brief interruptions to resolve without generating unnecessary trouble conditions.
57. B — A duct smoke detector that fails to activate during functional testing with approved aerosol smoke is a deficiency that must be documented. The device must be taken out of service and repaired or replaced. Attempting to adjust sensitivity thresholds or bypassing the detector in programming are not acceptable responses — the device must be functional before it can protect the HVAC system from distributing smoke.
58. C — When AC power is disconnected and the panel fails to transfer to battery power and shuts down completely, the most likely cause is dead, disconnected, or failed batteries. The batteries are the secondary power source that should automatically sustain the system when primary power is lost. If the batteries have no charge, are physically disconnected, or have internally failed, the panel has no power source and shuts down.
59. A — Analog addressable (intelligent) systems continuously monitor each detector's analog sensitivity values and can generate sensitivity reports showing current readings versus acceptable ranges. Reviewing these panel-generated reports satisfies the NFPA 72 sensitivity testing requirement without physically accessing each detector. This is the most efficient sensitivity testing method available for intelligent systems.
60. D — The Record of Completion is required by NFPA 72 Section 7.8.2 as a code-mandated document that certifies the fire alarm system was installed and tested in compliance with the code. Its absence means the system lacks formal documentation of compliance. The Record of Completion is not optional, supplementary, or limited to systems installed after a specific date — it is required for every fire alarm system.
61. B — A reading of 0 VDC at the NAC output terminals during standby is abnormal if the panel is supposed to be supervising the circuit. Most panels apply a supervision voltage to NAC circuits during standby to monitor circuit integrity. A complete absence of voltage at the output suggests

the NAC output circuit board, internal fuse, or output driver has failed. The NAC board or fuse requires inspection and replacement.

62. A — In an addressable system, a communication failure for a specific device means that individual device has stopped responding to the panel's polling commands. The panel continuously polls each addressed device on the SLC, and when a device fails to respond, the panel generates a trouble signal identifying the non-communicating device. Causes include device failure, wiring faults at that device, or incorrect address programming.
63. C — The 20% safety factor compensates for real-world conditions that reduce battery capacity below the manufacturer's nominal rating. Battery capacity degrades with age, cold temperatures reduce available capacity, and manufacturing tolerances mean individual batteries may vary from their rated specifications. The safety factor ensures the batteries can still meet the required duration under worst-case conditions throughout their service life.
64. D — NFPA 72 Section 18.5.5.7 requires that all visible notification appliances within the same field of view flash in synchronization. Unsynchronized strobes flashing at different rates create a disorienting, potentially seizure-inducing effect for photosensitive individuals. During testing, the technician must verify that any strobes visible from the same location flash simultaneously.
65. A — When the panel displays the correct device address but the wrong location description, the most likely cause is an incorrect location descriptor programmed into the panel for that address. The device hardware is transmitting the correct address, and the panel is receiving it correctly — but the text label programmed for that address does not match the device's actual installed location. The programming must be corrected.
66. B — NFPA 72 Table 14.4.3.2 requires waterflow switches to be functionally tested semiannually by flowing water through the inspector's test connection. The technician opens the test valve and verifies that the waterflow switch activates within 90 seconds and that the FACU receives and processes the correct alarm signal. Semiannual testing ensures the mechanical paddle mechanism remains responsive.
67. C — When disconnecting the field wiring at the panel clears the trouble signal, it confirms that the fault originates somewhere on the field wiring or connected devices — not on the panel's internal circuitry. If the fault were on the panel's circuit board, the trouble would persist even with the field wiring disconnected. The technician can now proceed to isolate the fault location using the divide-and-conquer method on the field wiring.
68. D — Using an open flame, matches, or any other actual combustion source to test smoke detectors is prohibited. These methods produce inconsistent and uncontrollable test stimuli, contaminate the detector's sensing chamber with combustion byproducts, and create a fire hazard on the job site. Only listed aerosol smoke products or calibrated smoke generators designed specifically for detector testing should be used.

69. A — A battery set that starts at 26.4 VDC and drops to 24.8 VDC under full alarm load is performing acceptably. The voltage remained well above the minimum operating voltage for 24 VDC fire alarm equipment (typically 20.4 VDC minimum for most panels) throughout the load test. Some voltage drop under load is normal and expected — the key is that the voltage remains within the acceptable operating range.
70. B — Vehicle exhaust fumes are the most common cause of nuisance alarms from smoke detectors in parking garages. Exhaust particulates enter the detector's sensing chamber and trigger the same response as actual smoke particles. Parking garages are one of the environments where smoke detectors are generally not recommended — heat detectors or flame detectors are typically more appropriate for this application.
71. D — NFPA 72 Section 14.2.2 requires that when a significant system impairment exists, a fire watch may need to be established. A fire watch involves assigning trained personnel to patrol the impaired areas and provide manual fire detection and notification until the system is restored to full operation. This compensatory measure ensures an acceptable level of fire protection during the impairment period.
72. C — When a duct smoke detector activates but the associated air handling unit does not shut down, the HVAC shutdown interface has failed. This is a critical deficiency because the purpose of the duct detector is specifically to shut down the AHU and prevent mechanical distribution of smoke. The interface failure must be documented, investigated, and repaired, and the corrected interface must be retested to verify proper operation.
73. B — If the building has normal utility power but the fire alarm panel's AC indicator is off and the system is running on batteries, the most likely cause is that the dedicated branch circuit breaker has tripped or been turned off at the distribution panel. This is a straightforward power supply issue — verify the breaker position, reset if tripped, and investigate the cause of any trip to prevent recurrence.
74. A — NFPA 72 Section 14.6 requires that inspection and testing records include the date, the name of the qualified technician, the name of the service organization, a complete list of all devices and components tested, and the individual results for each device or component tested. This comprehensive documentation demonstrates compliance with the code and creates a maintenance history for the system.
75. D — Sharing NICET exam content violates both the Non-Disclosure Agreement signed before the exam and the NICET Code of Ethics. NICET can investigate violations and impose sanctions ranging from reprimand to certification revocation. The NDA specifically states that divulging exam contents to others in any manner is expressly forbidden. This requirement protects the integrity of the certification program.
76. C — A reading of 28.1 VDC at the battery terminals with the charger connected is a normal float charge voltage for a 24 VDC sealed lead-acid battery system. Float voltage for two 12V SLA

batteries in series typically ranges from 27.0 to 27.6 VDC, and readings slightly above this range during active charging are common and acceptable. This is not an overcharging condition.

77. B — When the panel correctly identifies the alarm from the pull station but only activates notification on one floor instead of all floors as required by the sequence of operations, the most likely cause is a programming error. The panel programming does not correctly assign all notification zones to that initiating device input. The sequence of operations matrix must be reviewed and the programming corrected to activate all required notification zones.
78. A — Per NFPA 72 Table 14.4.3.2, the first sensitivity test is required within one year of installation, then every alternate year thereafter. For a system installed five years ago, tests should have been completed at year one, year three, and year five — a total of three sensitivity tests. Missing three years of testing means at least one required test cycle has been skipped.
79. D — A resistance reading of 0.5 ohms on a Zone 3 IDC — far below the expected EOLR value of thousands of ohms — indicates a short circuit between the two conductors. Many conventional panels interpret a short circuit on an IDC as a device activation (alarm condition) because the low resistance mimics the electrical change produced when a conventional detector activates. The short must be located and repaired.
80. C — NFPA 72 Section 10.6.7.2 permits the secondary battery standby requirement to be reduced from 24 hours to 4 hours when the fire alarm panel's primary power is supplied from a circuit backed by an emergency or standby generator that meets specific reliability criteria. These criteria include automatic start, automatic transfer, and adequate fuel capacity to sustain the generator for the required duration.
81. A — A full event history log that can no longer record new events is a functional concern because the log provides critical diagnostic information for troubleshooting and maintains a record of system activity. The log should be printed or downloaded for archival purposes and then cleared to restore the panel's ability to record future events. Some panels may overwrite automatically, but this should be verified.
82. B — When the supervising station receives a trouble signal instead of the alarm signal that was transmitted, the communication module or panel programming is transmitting the wrong signal type. The panel may have incorrect event codes programmed for that signal category, or the communication module may be formatting the signal incorrectly. The programming must be reviewed and corrected to ensure alarm signals are transmitted as alarms.
83. D — A fire alarm device schedule lists each device by its address number, device type (smoke detector, heat detector, module, etc.), location description, circuit assignment (which SLC or IDC it is connected to), and zone designation. This document is essential for installation, programming, testing, and maintenance — it is the master reference that connects each physical device to its system configuration.

84. D — A "Revise and Resubmit" disposition means the reviewing engineer found significant errors, omissions, or non-compliance issues that require substantial corrections. The contractor must revise the drawings to address all noted deficiencies and resubmit the corrected package for another review cycle. Installation cannot proceed until the resubmitted drawings receive an approved disposition.
85. C — At 14.8 VDC, the voltage at the farthest appliance falls below the minimum listed operating voltage of 16 VDC. This means the appliance may not produce its rated output or may fail to operate entirely. The designer must resolve the voltage drop by using larger conductors (lower resistance), shortening the circuit run, reducing the number of appliances on the circuit, or adding a remote booster power supply.