

PRACTICE TEST 14: FIRE PROTECTION SYSTEMS

Instructions: Select the best answer for each question. Each question is based on the Airframe Mechanic Certification Standards

1. Fire requires three elements known as the:
 - A. Safety triangle
 - B. Prevention triangle
 - C. Fire triangle: fuel, oxygen, heat
 - D. Combustion square

2. Removing any element of the fire triangle will:
 - A. Extinguish the fire
 - B. Increase fire intensity
 - C. Have no effect
 - D. Create explosion

3. Class A fires involve:
 - A. Flammable liquids
 - B. Ordinary combustibles (wood, paper, cloth)
 - C. Electrical equipment
 - D. Metals

4. Class B fires involve:
 - A. Wood and paper
 - B. Electrical equipment
 - C. Metals
 - D. Flammable liquids and gases

5. Class C fires involve:
 - A. Energized electrical equipment
 - B. Combustible metals
 - C. Wood products
 - D. Cooking oils

6. Class D fires involve:
 - A. Liquids
 - B. Electrical

- C. Combustible metals (magnesium, titanium)
 - D. Paper
7. Aircraft fire zones include:
- A. Cabin only
 - B. Wings only
 - C. Cargo only
 - D. Engine, APU, cargo, lavatory areas
8. Engine fire zones are designated based on:
- A. Size only
 - B. Presence of ignition sources, fuel, and airflow
 - C. Color
 - D. Location only
9. Fire zone requirements include:
- A. No detection needed
 - B. Open access
 - C. Fireproof/fire-resistant materials, detection, suppression
 - D. Standard materials only
10. Thermal fire detectors sense:
- A. Temperature rise or rate of temperature increase
 - B. Smoke only
 - C. Flame color
 - D. Pressure changes
11. Thermocouple fire detectors:
- A. Sense smoke
 - B. Detect pressure
 - C. Measure airflow
 - D. Generate voltage from heat differential
12. Continuous-loop fire detectors use:
- A. Single point sensing
 - B. Element resistance change along entire loop length
 - C. Pressure sensing
 - D. Optical detection
13. Pneumatic fire detection systems:
- A. Use gas-filled tube expanding with heat
 - B. Use water pressure
 - C. Detect smoke only
 - D. Are electric powered

14. Thermal switch fire detectors:
 - A. Are continuous
 - B. Measure pressure
 - C. Close contacts at preset temperature
 - D. Detect smoke

15. Fenwal continuous-loop detectors contain:
 - A. Water
 - B. Air
 - C. Oil
 - D. Resistance wire in ceramic core

16. Kidde continuous-loop detectors use:
 - A. Gas pressure
 - B. Eutectic salt center conductor
 - C. Water expansion
 - D. Mechanical switches

17. Fire detection loop integrity testing checks:
 - A. Color
 - B. Weight
 - C. Resistance and continuity
 - D. Age

18. A fire warning activates when:
 - A. Detector senses fire conditions
 - B. Engine starts
 - C. Landing gear extends
 - D. Fuel pressure drops

19. Fire detection system test ensures:
 - A. Color verification
 - B. Weight compliance
 - C. Age limits
 - D. Proper detector and annunciator operation

20. Fire detection loop resistance should be:
 - A. Infinite
 - B. Within manufacturer specifications
 - C. Zero
 - D. Variable

21. Smoke detection systems use:
 - A. Optical or ionization sensors

- B. Temperature sensing only
 - C. Pressure changes
 - D. Color recognition
22. Optical smoke detectors sense:
- A. Temperature
 - B. Pressure
 - C. Light scattering or absorption by smoke particles
 - D. Humidity
23. Ionization smoke detectors:
- A. Use heat sensing
 - B. Detect particle disruption of ionized air current
 - C. Measure pressure
 - D. Sense color
24. Lavatory smoke detectors are:
- A. Not required
 - B. Optional
 - C. For decoration
 - D. Required with automatic waste bin extinguisher
25. Cargo compartment smoke detection:
- A. Is not needed
 - B. Uses heat only
 - C. Alerts crew to fire in cargo areas
 - D. Measures pressure
26. Halon 1301 extinguishing agent:
- A. Interrupts chemical reaction of combustion
 - B. Cools only
 - C. Adds oxygen
 - D. Increases temperature
27. Halon 1301 advantages include:
- A. High residue
 - B. Corrosive properties
 - C. Low toxicity at design concentrations
 - D. Clean, electrically non-conductive, low toxicity
28. CO₂ (carbon dioxide) extinguishes fire by:
- A. Heating
 - B. Displacing oxygen (smothering)

- C. Adding fuel
 - D. Increasing pressure
29. CO₂ disadvantages include:
- A. Asphyxiation hazard in confined spaces
 - B. Leaves residue
 - C. Conducts electricity
 - D. Is flammable
30. Water extinguishes fire primarily by:
- A. Adding oxygen
 - B. Increasing temperature
 - C. Cooling below ignition temperature
 - D. Chemical reaction
31. Dry chemical extinguishing agents:
- A. Are liquids
 - B. Conduct electricity
 - C. Leave no residue
 - D. Interrupt combustion and smother flames
32. HFC (hydrofluorocarbon) agents:
- A. Deplete ozone
 - B. Replace Halon with similar effectiveness
 - C. Are highly toxic
 - D. Conduct electricity
33. Engine fire extinguishing systems typically use:
- A. Halon or HFC agent in pressurized containers
 - B. Water spray
 - C. Foam
 - D. Sand
34. Fire extinguisher bottles contain:
- A. Water
 - B. Air
 - C. Pressurized extinguishing agent
 - D. Fuel
35. Fire bottle discharge indication shows:
- A. Bottle is full
 - B. Normal condition
 - C. No discharge
 - D. Agent has been released

36. Thermal discharge indicators:
- A. Show bottle pressure
 - B. Yellow or red disc indicating overheat discharge
 - C. Measure agent quantity
 - D. Test electrical systems
37. Two-shot fire systems provide:
- A. Two separate discharges for redundancy
 - B. Single discharge only
 - C. No discharge
 - D. Continuous flow
38. Fire switch (T-handle) operation:
- A. Starts engine
 - B. Increases fuel flow
 - C. Adds hydraulic pressure
 - D. Shuts off fuel, hydraulics, arms extinguisher
39. Engine fire procedure typically involves:
- A. Increasing power
 - B. Adding fuel
 - C. Closing fire handle, discharging agent
 - D. Opening cowling
40. Cross-feed capability allows:
- A. Refueling
 - B. Discharging one bottle to multiple engines
 - C. Adding pressure
 - D. Cooling engines
41. APU fire protection systems include:
- A. No protection
 - B. Manual extinguishers only
 - C. Visual monitoring
 - D. Automatic detection and suppression
42. APU fire extinguisher may:
- A. Discharge automatically without crew action
 - B. Require manual operation only
 - C. Have no discharge capability
 - D. Use water only
43. Cargo compartment fire suppression:
- A. Is not provided

- B. Uses handheld extinguishers only
 - C. Fixed Halon/HFC flooding entire compartment
 - D. Requires manual activation
44. Class C cargo compartments require:
- A. No suppression
 - B. Detection, suppression, controlled ventilation
 - C. Open ventilation
 - D. No detection
45. Lavatory fire extinguisher:
- A. Automatically discharges into waste bin
 - B. Is not required
 - C. Requires pilot activation
 - D. Uses water only
46. Lavatory extinguishing agent typically:
- A. Water
 - B. Foam
 - C. CO₂
 - D. Halon or equivalent clean agent
47. Portable fire extinguishers are classified by:
- A. Weight only
 - B. Color only
 - C. Fire class they can combat
 - D. Age only
48. Water fire extinguishers are suitable for:
- A. Electrical fires
 - B. Class A fires only (not electrical or liquid fires)
 - C. All fire types
 - D. Metal fires
49. CO₂ portable extinguishers are effective on:
- A. Class B and C fires (liquids and electrical)
 - B. Class A only
 - C. Class D only
 - D. No fires
50. Halon portable extinguishers:
- A. Leave heavy residue
 - B. Conduct electricity

- C. Are obsolete
- D. Effective on A, B, C fires, minimal residue

51. Dry chemical extinguishers:

- A. Use water
- B. Are liquid-based
- C. Leave powder residue requiring cleanup
- D. Conduct electricity

52. Fire extinguisher inspection includes:

- A. Color only
- B. Pressure gauge, seals, accessibility, mounting
- C. Weight only
- D. Age markings only

53. Fire extinguisher pressure gauge:

- A. Is decorative
- B. Has no purpose
- C. Measures fuel
- D. Indicates charge status

54. Overcharged fire extinguisher:

- A. Should be discharged or serviced
- B. Is acceptable
- C. Is preferred
- D. Indicates low agent

55. Fire extinguisher hydrostatic testing:

- A. Is never required
- B. Tests cylinder integrity at intervals
- C. Uses fire
- D. Tests agent only

56. Fire detection loop inspection checks for:

- A. Color only
- B. Age only
- C. Damage, chafing, security, proper routing
- D. Weight only

57. Fire loop replacement requires:

- A. Matching specifications and proper installation
- B. Any wire
- C. Random routing
- D. No testing

58. Fire bottle weight check:
- A. Is never done
 - B. Uses visual inspection only
 - C. Requires flight
 - D. Verifies full charge by weighing
59. Fire bottle discharge cartridge:
- A. Lasts forever
 - B. Should be replaced per schedule or after discharge
 - C. Never requires replacement
 - D. Is decorative
60. Fire detection system false alarms may indicate:
- A. Perfect operation
 - B. Full bottles
 - C. Detector malfunction, chafed wiring, moisture
 - D. Low fuel
61. Intermittent fire warnings suggest:
- A. Normal operation
 - B. Full charge
 - C. Perfect system
 - D. Loose connection or failing detector
62. No fire warning during test indicates:
- A. Detector, wiring, or annunciator failure
 - B. Perfect operation
 - C. Full bottle
 - D. Normal condition
63. Fire bottle low pressure shows:
- A. Perfect charge
 - B. Leakage or thermal discharge
 - C. Overfill
 - D. New bottle
64. Troubleshooting fire detection starts with:
- A. Replacing all components
 - B. Random checks
 - C. System tests, wiring checks, detector resistance
 - D. Visual only
65. Fire detection system wiring must be:
- A. Fire-resistant and properly routed

- B. Standard wire
- C. Any wire type
- D. Decorative

66. Fire zone ventilation:

- A. Is unrestricted
- B. Has no design
- C. Is random
- D. Designed to prevent combustible accumulation

67. Fireproof materials withstand:

- A. Low temperatures only
- B. Short exposure
- C. Design fire exposure without failure
- D. No heat

68. Fire-resistant materials:

- A. Burn immediately
- B. Withstand heat for specified time but may fail
- C. Have no heat tolerance
- D. Are flammable

69. Engine fire barriers (firewalls) must:

- A. Be painted
- B. Be transparent
- C. Allow fire passage
- D. Contain fire for 15 minutes minimum

70. Fire bottle discharge testing uses:

- A. Operational test or weight check verification
- B. Visual only
- C. Random methods
- D. No testing

71. Fire detector test set:

- A. Measures color
- B. Tests age
- C. Simulates heat activating detector
- D. Adds fuel

72. Fire loop continuity check uses:

- A. Visual inspection
- B. Ohmmeter measuring resistance

- C. Thermometer
- D. Pressure gauge

73. Fire warning system functional test:
- A. Verifies detection through annunciation operation
 - B. Checks color
 - C. Measures weight
 - D. Tests fuel
74. Squib (discharge cartridge) continuity test:
- A. Uses high current
 - B. Applies full voltage
 - C. Random testing
 - D. Checks electrical continuity without firing
75. Fire protection system certification requires:
- A. Random inspection
 - B. No documentation
 - C. Proper operation, inspections, testing per schedule
 - D. Visual checks only
76. Fire extinguisher accessibility means:
- A. Hidden storage
 - B. Readily available, marked, unobstructed
 - C. Random placement
 - D. Locked away
77. Fire protection placards indicate:
- A. Color preferences
 - B. Age
 - C. Random information
 - D. Extinguisher type, location, operating instructions
78. Post-fire inspection examines:
- A. Fire-damaged areas for structural integrity
 - B. Undamaged areas only
 - C. Paint color
 - D. Fuel quantity
79. Fire bottle servicing requires:
- A. Random procedures
 - B. No precautions
 - C. Proper agent, pressure, weight verification
 - D. Visual only

80. Halon replacement bottles use:
- A. Water
 - B. HFC or approved equivalent agents
 - C. Fuel
 - D. Air only
81. Fire zone temperature limits protect:
- A. Components from heat damage
 - B. Nothing
 - C. Paint only
 - D. Weight
82. Heat shields and insulation:
- A. Add weight only
 - B. Are decorative
 - C. Have no purpose
 - D. Protect structures from radiant heat
83. Cowling and duct seals:
- A. Are decorative
 - B. Increase drag
 - C. Prevent fire spread between compartments
 - D. Add weight only
84. Fire extinguisher agent compatibility:
- A. Doesn't matter
 - B. Must match aircraft system specifications
 - C. Any agent works
 - D. Random selection
85. Mixing fire extinguishing agents:
- A. Improves effectiveness
 - B. Is recommended
 - C. Has no effect
 - D. May reduce effectiveness or create hazards
86. Fire protection system modifications require:
- A. FAA approval and documentation
 - B. No approval
 - C. Verbal permission
 - D. Random changes
87. Fire detection loop routing must:
- A. Be random

- B. Follow any path
- C. Maintain clearances, avoid damage, provide coverage
- D. Touch hot surfaces

88. Cargo fire suppression concentration:

- A. Is random
- B. Calculated for compartment volume
- C. Has no requirements
- D. Uses visual estimation

89. Engine fire extinguisher discharge time:

- A. Should provide effective concentration quickly
- B. Has no limits
- C. Should be very slow
- D. Doesn't matter

90. Fire suppression effectiveness depends on:

- A. Color
- B. Age
- C. Weight
- D. Agent type, concentration, discharge rate, coverage

91. Fire safety training includes:

- A. No training needed
- B. Random instruction
- C. Extinguisher use, emergency procedures, evacuation
- D. Theory only

92. Fire extinguisher operation training:

- A. Is optional
- B. Required for maintenance personnel
- C. Not necessary
- D. Decorative

93. Emergency evacuation procedures:

- A. Are secret
- B. Not needed
- C. Random
- D. Must be posted and practiced

94. Personal protective equipment for fire:

- A. Fire-resistant clothing, gloves, face protection
- B. Regular clothes

- C. No protection needed
- D. Decorative items

95. Fire bottle safety procedures include:
- A. Random handling
 - B. Proper handling, no heat exposure, secure storage
 - C. Any storage method
 - D. No precautions
96. Pressurized fire bottles must:
- A. Be dropped
 - B. Be heated
 - C. Be secured against movement and pressure relief
 - D. Be left unsecured
97. Fire extinguisher agent exposure requires:
- A. Ventilation and avoiding inhalation
 - B. No precautions
 - C. Immediate reuse
 - D. Heating area
98. Halon exposure in confined space:
- A. Is beneficial
 - B. Improves breathing
 - C. Has no effects
 - D. Requires evacuation, ventilation
99. Fire zone inspection frequency:
- A. Random
 - B. Once in lifetime
 - C. Per maintenance manual and after fire indication
 - D. Never
100. Post-discharge fire bottle:
- A. Can remain installed
 - B. Must be recharged or replaced before flight
 - C. Is decorative
 - D. Requires no action

Answer Explanations

- 1. C. Fire triangle: fuel, oxygen, heat** Fire requires three elements forming the fire triangle: fuel (combustible material), oxygen (typically from air, minimum 16%), and heat (sufficient temperature reaching ignition point). All three must be present simultaneously for combustion.
- 2. A. Extinguish the fire** Removing any element of the fire triangle extinguishes fire. Fire suppression works by removing fuel (shutoff valves), oxygen (smothering with CO₂), or heat (cooling with water).
- 3. B. Ordinary combustibles (wood, paper, cloth)** Class A fires involve ordinary combustible materials like wood, paper, cloth, rubber, and plastics leaving ash when burned. Extinguished with water or multipurpose dry chemical.
- 4. D. Flammable liquids and gases** Class B fires involve flammable liquids (gasoline, oil, grease, paint) and gases. Do not use water (spreads liquid fires); use CO₂, dry chemical, or foam smothering oxygen.
- 5. A. Energized electrical equipment** Class C fires involve energized electrical equipment. Use non-conductive agents (CO₂, Halon, dry chemical). Never use water on energized electrical fires due to shock/electrocution hazard.
- 6. C. Combustible metals (magnesium, titanium)** Class D fires involve combustible metals (magnesium, titanium, sodium, potassium). Require special dry powder agents; water reacts violently with burning metals creating explosions.
- 7. D. Engine, APU, cargo, lavatory areas** Aircraft fire zones include engine compartments, APU bay, cargo compartments, lavatories (waste bins), and baggage areas—any area with potential ignition sources and combustible materials.
- 8. B. Presence of ignition sources, fuel, and airflow** Engine fire zones designated based on presence of ignition sources (hot components, electrical equipment), fuel lines/components, adequate airflow supporting combustion, requiring detection and suppression.
- 9. C. Fireproof/fire-resistant materials, detection, suppression** Fire zone requirements include fireproof or fire-resistant materials, complete fire detection coverage, adequate fire suppression, drainage for fluids, and ventilation preventing combustible accumulation.
- 10. A. Temperature rise or rate of temperature increase** Thermal fire detectors sense absolute temperature exceeding threshold or rate of temperature rise indicating fire. Include thermocouples, thermal switches, and continuous-loop systems.
- 11. D. Generate voltage from heat differential** Thermocouple fire detectors generate voltage from temperature difference between hot junction (fire zone) and cold junction (reference), voltage increase triggering fire warning.

12. B. Element resistance change along entire loop length Continuous-loop fire detectors use element whose electrical resistance decreases with temperature along entire length, providing complete zone coverage detecting fire anywhere along loop.

13. A. Use gas-filled tube expanding with heat Pneumatic fire detection uses gas-filled tube (typically helium) expanding when heated, increasing pressure activating diaphragm switch triggering alarm. Simple, reliable, no electrical power required in sensing element.

14. C. Close contacts at preset temperature Thermal switch fire detectors (spot detectors) close electrical contacts at specific preset temperature using bimetallic elements or fusible links. Provide point detection at specific locations.

15. D. Resistance wire in ceramic core Fenwal continuous-loop detectors contain resistance wire in ceramic core surrounded by eutectic salt within inconel tube. Heat increases conductivity triggering alarm when resistance drops below threshold.

16. B. Eutectic salt center conductor Kidde continuous-loop detectors use eutectic salt center conductor becoming conductive when heated, completing circuit to tube sheath triggering alarm. Entire loop length provides coverage.

17. C. Resistance and continuity Fire detection loop integrity testing measures electrical resistance (should be within specifications) and continuity (complete circuit), detecting broken wires, shorts, or deteriorated elements.

18. A. Detector senses fire conditions Fire warning activates when detector senses fire conditions (temperature rise, rate of rise) exceeding threshold, completing circuit energizing warning lights, bells, or master warning systems.

19. D. Proper detector and annunciator operation Fire detection system test uses test switch applying heat or simulating detector signal, verifying detector sensitivity, wiring integrity, control unit operation, and annunciator (lights, bells) function.

20. B. Within manufacturer specifications Fire detection loop resistance should be within manufacturer specifications (typically specific range indicating proper element condition). Too low indicates short; too high indicates open or deterioration.

21. A. Optical or ionization sensors Smoke detection systems use optical sensors (photoelectric—light scattering by particles) or ionization sensors (radiation ionizing air, particles disrupting current) detecting smoke before temperature rise.

22. C. Light scattering or absorption by smoke particles Optical smoke detectors sense light scattering (particles reflect light to sensor) or absorption (particles block light beam) caused by smoke particles, earlier detection than thermal sensors.

23. B. Detect particle disruption of ionized air current Ionization smoke detectors use small radioactive source ionizing air creating current between electrodes; smoke particles disrupt current flow reducing current triggering alarm.

24. D. Required with automatic waste bin extinguisher Lavatory smoke detectors required monitoring waste receptacle with automatic extinguisher discharging into bin if smoke detected, preventing fires from discarded smoking materials.

25. C. Alerts crew to fire in cargo areas Cargo compartment smoke detection alerts crew to fire in inaccessible cargo areas allowing activation of fire suppression before fire spreads, critical for Class C cargo compartments.

26. A. Interrupts chemical reaction of combustion Halon 1301 extinguishing agent interrupts chemical chain reaction of combustion at molecular level, effectively suppressing fire at lower concentrations than smothering agents.

27. D. Clean, electrically non-conductive, low toxicity Halon 1301 advantages include clean (no residue), electrically non-conductive (safe for electronics/electrical fires), relatively low toxicity at design concentrations, rapid extinguishment. Being phased out due to ozone depletion.

28. B. Displacing oxygen (smothering) CO₂ (carbon dioxide) extinguishes fire by displacing oxygen reducing concentration below combustion-supporting level (smothering), also provides some cooling. Effective on Class B and C fires.

29. A. Asphyxiation hazard in confined spaces CO₂ disadvantages include asphyxiation hazard in confined spaces (displaces breathable air), leaves no residue but provides no inerting after dissipation, cold discharge can cause frostbite.

30. C. Cooling below ignition temperature Water extinguishes fire primarily by cooling burning material below ignition temperature (heat absorption through evaporation), also provides some smothering effect from steam generation.

31. D. Interrupt combustion and smother flames Dry chemical extinguishing agents (sodium bicarbonate, monoammonium phosphate) interrupt combustion chain reaction and smother flames coating fuel surface. Effective on multiple fire classes.

32. B. Replace Halon with similar effectiveness HFC (hydrofluorocarbon) agents like HFC-125 and HFC-227ea replace Halon with similar effectiveness, clean discharge, low toxicity, without ozone-depleting properties. Approved Halon alternatives.

33. A. Halon or HFC agent in pressurized containers Engine fire extinguishing systems typically use Halon 1301 or HFC agents stored in pressurized spherical containers (fire bottles) with discharge cartridges releasing agent into fire zone.

34. C. Pressurized extinguishing agent Fire extinguisher bottles contain pressurized extinguishing agent (Halon, HFC, CO₂) with nitrogen pressurization, discharge cartridge (squib), and pressure gauge or thermal indicator.

35. D. Agent has been released Fire bottle discharge indication (illuminated discharge light, pressure gauge drop, thermal indicator) shows agent has been released into fire zone, confirming system activation.

36. B. Yellow or red disc indicating overheat discharge Thermal discharge indicators (yellow or red discs) on fire bottles rupture if bottle overheats, releasing pressure preventing bottle rupture, indicating thermal discharge not normal activation.

37. A. Two separate discharges for redundancy Two-shot fire systems provide two separate agent discharges (two bottles or one bottle with reserve) allowing second discharge if fire reignites or first discharge ineffective.

38. D. Shuts off fuel, hydraulics, arms extinguisher Fire switch (T-handle) pulled closes fuel shutoff valve, closes hydraulic shutoff valve, closes bleed air valve, de-energizes generator, and arms fire extinguisher for discharge.

39. C. Closing fire handle, discharging agent Engine fire procedure: throttle idle, fire handle pull (closes fuel/hydraulics), rotate handle to discharge position activating extinguisher, monitor fire indication, second discharge if needed.

40. B. Discharging one bottle to multiple engines Cross-feed capability allows discharging one fire bottle to either engine providing backup if one bottle discharged, requiring two bottles minimum for twin-engine but not one per engine.

41. D. Automatic detection and suppression APU fire protection includes automatic fire detection and automatic fire suppression (extinguisher discharges without crew action if APU running and fire detected), protecting unmanned compartment.

42. A. Discharge automatically without crew action APU fire extinguisher may discharge automatically if fire detected while APU running, or manually from cockpit fire switch, providing protection when APU operating unattended.

43. C. Fixed Halon/HFC flooding entire compartment Cargo compartment fire suppression uses fixed Halon or HFC system flooding entire compartment with extinguishing agent concentration, suppressing fire until landing.

44. B. Detection, suppression, controlled ventilation Class C cargo compartments require fire detection, built-in fire suppression, and controlled ventilation (can be shut off) isolating fire, preventing spread until landing.

45. A. Automatically discharges into waste bin Lavatory fire extinguisher automatically discharges Halon or equivalent agent into waste receptacle if smoke detector senses fire, suppressing fire from discarded smoking materials.

46. D. Halon or equivalent clean agent Lavatory extinguishing agent typically Halon 1301 or HFC equivalent providing rapid extinguishment without damaging property, safe in occupied space at design concentration.

47. C. Fire class they can combat Portable fire extinguishers classified by fire class capability: A (ordinary combustibles), B (flammable liquids), C (electrical), D (metals), with multipurpose covering multiple classes.

48. B. Class A fires only (not electrical or liquid fires) Water fire extinguishers suitable only for Class A fires (ordinary combustibles). Never use on electrical fires (shock hazard) or flammable liquid fires (spreads fire).

49. A. Class B and C fires (liquids and electrical) CO₂ portable extinguishers effective on Class B (flammable liquids) and Class C (electrical) fires through oxygen displacement, non-conductive, no residue.

50. D. Effective on A, B, C fires, minimal residue Halon portable extinguishers effective on Class A, B, and C fires with minimal residue, clean discharge, non-conductive, ideal for aircraft use. Being replaced with HFC equivalents.

51. C. Leave powder residue requiring cleanup Dry chemical extinguishers effective on multiple fire classes but leave powder residue requiring thorough cleanup, potentially corrosive to electronics and metal components.

52. B. Pressure gauge, seals, accessibility, mounting Fire extinguisher inspection checks pressure gauge (charged status), safety seals intact, accessibility (unobstructed, marked), secure mounting, no damage, proper type/location, hydrostatic test date.

53. D. Indicates charge status Fire extinguisher pressure gauge indicates charge status; green zone shows proper pressure, red indicates low pressure requiring recharge or replacement, overpressure indication shows overcharge.

54. A. Should be discharged or serviced Overcharged fire extinguisher (pressure above green zone) should be partially discharged or serviced per manufacturer procedures preventing excessive stress on cylinder.

55. B. Tests cylinder integrity at intervals Fire extinguisher hydrostatic testing pressurizes cylinder with water to test pressure (typically 5/3 working pressure) at specified intervals (5-12 years depending on type) verifying structural integrity.

56. C. Damage, chafing, security, proper routing Fire detection loop inspection checks for physical damage, chafing from vibration, secure mounting every 8-12 inches, proper routing with clearances, connector security, insulation condition.

57. A. Matching specifications and proper installation Fire loop replacement requires matching manufacturer specifications (type, length, resistance), proper routing maintaining clearances, secure mounting, connector installation, and system testing.

58. D. Verifies full charge by weighing Fire bottle weight check weighs bottle comparing to specified full weight (stamped on bottle), verifying adequate agent charge, detecting leakage without discharging bottle.

59. B. Should be replaced per schedule or after discharge Fire bottle discharge cartridge (squib) should be replaced per maintenance schedule (typically 5 years) or immediately after discharge ensuring reliable operation when needed.

60. C. Detector malfunction, chafed wiring, moisture Fire detection false alarms indicate detector malfunction (contamination, deterioration), chafed wiring causing shorts, moisture ingress, loose connections, or control unit problems.

61. D. Loose connection or failing detector Intermittent fire warnings suggest loose electrical connection causing intermittent contact, failing detector with marginal operation, damaged wiring, or vibration-induced shorts.

62. A. Detector, wiring, or annunciator failure No fire warning during test indicates detector failure (open circuit, loss of sensitivity), wiring break, blown fuse, control unit failure, or annunciator (bulb, bell) malfunction.

63. B. Leakage or thermal discharge Fire bottle low pressure indicates agent leakage (valve seat, connection, container), thermal discharge (overheat safety disc ruptured), or gauge malfunction requiring bottle replacement.

64. C. System tests, wiring checks, detector resistance Troubleshooting fire detection starts systematically with operational tests (test switch), wiring continuity and insulation checks, detector resistance measurements, control unit verification before component replacement.

65. A. Fire-resistant and properly routed Fire detection system wiring must be fire-resistant (withstand fire environment continuing operation), properly routed avoiding damage, secured against vibration, maintaining proper clearances.

66. D. Designed to prevent combustible accumulation Fire zone ventilation designed with adequate airflow preventing combustible vapor/fluid accumulation while not creating flammable mixture, drainage removing leaked fluids.

67. C. Design fire exposure without failure Fireproof materials withstand design fire exposure (typically 2000°F for 15 minutes) without failure, maintaining structural integrity and protective function. Used for firewalls and critical barriers.

68. B. Withstand heat for specified time but may fail Fire-resistant materials withstand heat for specified time (typically 5-15 minutes) providing protection during fire suppression but may eventually fail. Used where fireproof impractical.

69. D. Contain fire for 15 minutes minimum Engine fire barriers (firewalls) must contain engine fire for minimum 15 minutes preventing fire spread to aircraft structure, tested to withstand 2000°F flame exposure.

70. A. Operational test or weight check verification Fire bottle discharge testing uses operational test (actual discharge into test equipment) or weight check (comparing measured weight to specification) verifying adequate agent charge.

71. C. Simulates heat activating detector Fire detector test set applies heat (typically heating element) to continuous-loop detector or thermal switch simulating fire conditions, verifying proper activation temperature and system response.

72. B. Ohmmeter measuring resistance Fire loop continuity check uses ohmmeter measuring element resistance comparing to specifications, detecting open circuits (infinite resistance), shorts (zero resistance), or deteriorated elements.

73. A. Verifies detection through annunciation operation Fire warning system functional test activates test switch simulating fire signal, verifying complete system operation including detectors, control unit, annunciators (lights, bells), and cockpit indications.

74. D. Checks electrical continuity without firing Squib (discharge cartridge) continuity test uses low current ohmmeter checking electrical continuity through initiator without generating sufficient current/voltage to fire cartridge.

75. C. Proper operation, inspections, testing per schedule Fire protection system certification requires demonstrated proper operation, scheduled inspections (preflight, periodic), functional testing, maintenance documentation, and AD compliance.

76. B. Readily available, marked, unobstructed Fire extinguisher accessibility requires readily available location, clearly marked with placard/sign, unobstructed access, secure mounting preventing shifting, within reach from operating positions.

77. D. Extinguisher type, location, operating instructions Fire protection placards indicate extinguisher type (Halon, CO₂, water), location markings, fire class ratings, operating instructions ensuring proper emergency use.

78. A. Fire-damaged areas for structural integrity Post-fire inspection examines fire-damaged structures for weakening (heat damage to aluminum, composites), wiring insulation damage, fluid line integrity, component damage requiring replacement or repair.

79. C. Proper agent, pressure, weight verification Fire bottle servicing requires proper extinguishing agent type and purity, correct pressurization (typically 600-900 psi nitrogen), weight verification, new discharge cartridge, leak testing.

80. B. HFC or approved equivalent agents Halon replacement bottles use HFC-125, HFC-227ea, or other approved equivalent agents providing similar fire suppression effectiveness without ozone-depleting properties.

81. A. Components from heat damage Fire zone temperature limits protect temperature-sensitive components (wiring, seals, composites) from heat damage through proper insulation, heat shields, and cooling airflow.

82. D. Protect structures from radiant heat Heat shields and insulation protect aircraft structure and components from radiant heat from engines, exhaust, and APU using reflective barriers and thermal insulation materials.

83. C. Prevent fire spread between compartments Cowling and duct seals prevent fire, hot gases, and fluids from spreading between compartments, maintaining fire zone integrity and preventing fire extension beyond protected area.

84. B. Must match aircraft system specifications Fire extinguisher agent compatibility must match aircraft system specifications ensuring proper suppression concentration, material compatibility, discharge characteristics, and regulatory approval.

85. D. May reduce effectiveness or create hazards Mixing fire extinguishing agents may reduce effectiveness through chemical interactions, create toxic decomposition products, cause unpredictable reactions, or inadequate suppression concentration.

86. A. FAA approval and documentation Fire protection system modifications require FAA approval (STC, field approval, 337), engineering data, proper installation, testing verification, and permanent aircraft records documentation.

87. C. Maintain clearances, avoid damage, provide coverage Fire detection loop routing must maintain clearances from hot surfaces (prevent false alarms), avoid sharp edges/pinch points, provide complete zone coverage, allow thermal expansion.

88. B. Calculated for compartment volume Cargo fire suppression concentration calculated for specific compartment volume ensuring adequate agent quantity achieving design concentration (typically 6% Halon or equivalent HFC).

89. A. Should provide effective concentration quickly Engine fire extinguisher discharge time should achieve effective suppression concentration quickly (typically complete discharge within 1-2 seconds) preventing fire spread and structural damage.

90. D. Agent type, concentration, discharge rate, coverage Fire suppression effectiveness depends on proper agent type for fire class, adequate concentration, rapid discharge rate achieving concentration before fire spreads, and complete coverage.

91. C. Extinguisher use, emergency procedures, evacuation Fire safety training includes fire extinguisher selection and operation, emergency procedures (engine fire, cabin fire), evacuation procedures, crew coordination, and hands-on practice.

92. B. Required for maintenance personnel Fire extinguisher operation training required for maintenance personnel including proper selection for fire class, PASS technique (Pull, Aim, Squeeze, Sweep), safety distance, escape route.

93. D. Must be posted and practiced Emergency evacuation procedures must be clearly posted showing exit locations and routes, practiced regularly through drills, ensuring personnel can evacuate quickly during fire emergencies.

94. A. Fire-resistant clothing, gloves, face protection Personal protective equipment for fire includes fire-resistant coveralls/clothing, heat-resistant gloves, face shield or safety glasses, hearing protection near suppressors, and respirator if needed.

95. B. Proper handling, no heat exposure, secure storage Fire bottle safety procedures include proper handling (no dropping or impact), storage away from heat sources (temperature limits), secure storage preventing falling or rolling.

96. C. Be secured against movement and pressure relief Pressurized fire bottles must be secured against movement during installation or storage, safety caps on pressure relief fittings, stored upright or per specifications.

97. A. Ventilation and avoiding inhalation Fire extinguisher agent exposure requires immediate area ventilation, avoiding breathing vapors or decomposition products, evacuating if high concentration, seeking fresh air.

98. D. Requires evacuation, ventilation Halon exposure in confined space requires immediate evacuation (asphyxiation hazard from oxygen displacement), thorough ventilation before re-entry, monitoring atmosphere.

99. C. Per maintenance manual and after fire indication Fire zone inspection frequency follows maintenance manual (preflight, periodic intervals) and mandatory after any fire indication (even false alarms) checking for damage, leakage, overheating.

100. B. Must be recharged or replaced before flight Post-discharge fire bottle must be immediately recharged (if serviceable) or replaced before further flight, system restored to fully operational status ensuring fire protection available.