

DCD Exam Question Bank – Automatic Sprinkler Systems

Section 1: Fundamentals & Standards

Q1. What is the primary international reference standard for sprinkler system design in UAE?

A: NFPA 13.

Q2. Define 'Light Hazard Occupancy' under NFPA 13.

A: Occupancy with low combustibility and fire load, e.g., offices, schools.

Q3. Which UAE authority approves sprinkler system installations?

A: Civil Defence Authority of respective Emirate.

Q4. State three objectives of an automatic sprinkler system.

A: Life safety, property protection, and continuity of operations.

Q5. What is the minimum design density for Light Hazard occupancies?

A: 0.10 gpm/ft² over 1,500 ft².

Q6. Which NFPA standard governs sprinkler system testing and maintenance?

A: NFPA 25.

Q7. What is the maximum allowable sprinkler coverage area for Light Hazard?

A: 225 sq. ft. per sprinkler.

Q8. Which international listings must equipment comply with in UAE?

A: UL and FM approved listings.

Q9. In UAE, who can submit sprinkler designs for approval?

A: Licensed consultants and contractors registered with Civil Defence.

Q10. Give an example of a Light Hazard occupancy where sprinklers are mandatory.

A: An office building in Dubai with partitioned cabins.

Section 2: Types of Sprinkler Systems

Q11. Name the four major sprinkler system types.

A: Wet, Dry, Preaction, Deluge.

Q12. Where are Wet Pipe systems most commonly used?

A: Non-freezing conditioned buildings such as offices and malls.

Q13. When is a Dry Pipe system recommended?

A: In car parking basements subject to sub-zero winter temperatures.

Q14. Which system requires a detection system to open valves?

A: Preaction system.

Q15. What is the application of a Deluge system?

A: High-hazard areas like aircraft hangars or oil refineries.

Q16. What type of sprinkler system is recommended for server rooms?

A: Preaction system to avoid accidental water discharge.

Q17. How is corrosion mitigated in Dry Pipe systems?

A: By using nitrogen instead of compressed air.

Q18. Can multiple system types exist in a single building?

A: Yes, for example, Wet system in offices and Preaction in data centers.

Q19. Give an example of a facility requiring Deluge sprinklers.

A: Petrochemical storage yard in Abu Dhabi.

Q20. What is a combined Dry/Preaction system?

A: A hybrid system used in highly sensitive environments like museums.

Section 3: Hydraulic Design & Density

Q21. Minimum operating pressure for a standard spray sprinkler?

A: 7 psi.

Q22. State the Ordinary Hazard Group 2 design density.

A: 0.20 gpm/ft² over 1,500 ft².

Q23. What is the maximum design area for Light Hazard with quick-response sprinklers?

A: 1,500 sq. ft. reduced to 900 sq. ft.

Q24. Define 'Hose Stream Allowance' for Ordinary Hazard.

A: 250 gpm for 30 minutes.

Q25. Which method is used for storage design?

A: Commodity classification with CMDA, CMSA, or ESFR design.

Q26. What is the pressure loss formula used in hydraulic calculations?

A: Hazen-Williams equation.

Q27. What is the required K-factor for Light Hazard standard spray sprinklers?

A: K5.6 (80 metric).

Q28. Which safety margin is commonly applied to water supply curves?

A: 10% or 5 psi above demand.

Q29. Give an example of hydraulic demand exceeding supply.

A: A warehouse where hydrant demand + sprinkler demand exceeds available pump flow.

Q30. What is the minimum residual pressure required at the most remote sprinkler?

A: 7 psi (0.5 bar).

Section 4: Installation Requirements

Q31. What is the maximum spacing between sprinklers in Light Hazard?

A: 15 ft apart.

Q32. Minimum distance of deflector from ceiling?

A: 1–12 inches.

Q33. What is the max coverage per sprinkler in Light Hazard?

A: 225 sq. ft.

Q34. Are sprinklers required in concealed spaces?

A: Yes, unless exempted by NFPA 13.

Q35. What is the clearance required around sprinklers?

A: 18 inches below deflector must be kept clear.

Q36. What is the requirement for sprinklers near beams?

A: Must follow obstruction tables in NFPA 13.

Q37. What is the requirement for sidewall sprinklers?

A: Must be installed at proper distance from ceiling and wall per listing.

Q38. Can sprinklers be painted after installation?

A: No, only manufacturer-applied paint is allowed.

Q39. What is the rule for installing sprinklers in corridors?

A: Must be spaced to cover entire width, typically max. 7.5 ft from wall.

Q40. Give an example of an obstruction issue.

A: Sprinkler installed directly under an air duct in a mall ceiling.

Section 5: Special Requirements

Q41. Are sprinklers required in electrical rooms?

A: Yes, unless exempted (2-hr rated enclosure, minimal combustibles).

Q42. Are sprinklers required in generator rooms?

A: Yes, unless alternate suppression is approved.

Q43. Are sprinklers required in kitchens?

A: Yes, but must be supplemented by hood suppression systems.

Q44. Which suppression system is used in data centers?

A: Clean agent or preaction sprinkler system.

Q45. What is the Civil Defence requirement for seismic bracing?

A: Mandatory per NFPA 13 Ch. 17 for pipes ≥ 2.5 in.

Q46. What special system is used for aircraft hangars?

A: Deluge with foam-water sprinklers.

Q47. Are sprinklers required in lift shafts?

A: No, unless used for storage or machinery inside.

Q48. Are sprinklers required in garbage chutes?

A: Yes, with automatic sprinkler head at top and bottom.

Q49. Give an example of exemption in electrical rooms.

A: LV panel room with 2-hr rating and fire-rated cable trays.

Q50. Are sprinklers required in atrium spaces?

A: Yes, designed per smoke control and fire load analysis.

Section 6: Inspection, Testing & Maintenance

Q51. How often should sprinklers be visually inspected?

A: Monthly owner check, annually by qualified contractor.

Q52. Frequency of hydrostatic testing for new systems?

A: At acceptance, 200 psi for 2 hours.

Q53. What is the frequency of flow tests for fire pumps?

A: Annually.

Q54. What is the frequency of weekly churn test for pumps?

A: Weekly without flow.

Q55. What is the replacement interval for fast-response sprinklers in hospitals?

A: 20 years then 10-year intervals.

Q56. What is the interval for standard-response sprinkler testing?

A: 50 years then every 10 years.

Q57. Who is responsible for ITM records?

A: The building owner/occupier.

Q58. What test is conducted at final acceptance?

A: Hydrostatic and main drain test.

Q59. What happens if paint is found on a sprinkler head?

A: Must be replaced immediately.

Q60. Give an example of Civil Defence rejection during inspection.

A: Using non-UL/FM listed sprinklers in a Dubai high-rise.

Section 7: Civil Defence Approval Process

Q61. What documents are mandatory for sprinkler approval?

A: Design drawings, hydraulic calcs, equipment datasheets, UL/FM certificates.

Q62. At what stage is Civil Defence approval first sought?

A: At design submission stage.

Q63. When does Civil Defence conduct site inspection?

A: During installation and at final acceptance.

Q64. What is tested during final approval?

A: Hydrostatic test, main drain test, alarm signal test.

Q65. Who submits O&M; manuals?

A: Contractor before handover.

Q66. Can Civil Defence reject a system with undersized pumps?

A: Yes, if hydraulic demand is not met.

Q67. Who is responsible for re-submittals if drawings are rejected?

A: Consultant/contractor.

Q68. Give an example of Civil Defence non-compliance issue.

A: Absence of sprinkler coverage in concealed ceiling spaces.

Q69. Is Civil Defence approval required before energizing the building?

A: Yes, NoC (No Objection Certificate) is mandatory.

Q70. What happens if modifications are made after approval?

A: Must be re-submitted to Civil Defence for review.