Chapter 16 Test

Name: ___________________________  Date: __________________________

Directions: Write the correct letter on the blank before each question.

Objective 1: Describe the methods by which fire fighting foam prevents or controls a hazard.

Objective 2: Identify foam concentrates.

Objective 3: Explain the factors that impact foam expansion and selection.

Objective 4: Describe methods by which foam may be proportioned.

1. Which action of fire fighting foam creates a barrier between the fuel and the fire? (967)
   A. Cooling
   B. Aerating
   C. Separating
   D. Penetrating

2. Foam lowers surface tension of water, allowing it to ___ fires in Class A materials. (967)
   A. cool
   B. smother
   C. suppress
   D. penetrate
3. Class A foam extinguishes and/or prevents ignition by: (967)
   A. allowing water to penetrate fuels.
   B. creating a barrier between the fuel and the fire.
   C. preventing air from reaching the fuel or mixing with vapors.
   D. lowering the temperature of the fuel and adjacent surfaces.

4. Which of the following statements about fire fighting foams is MOST accurate? (967)
   A. The majority of fire fighting foams are Class A and Class K.
   B. Class A foam is especially effective on hydrocarbon fuels and polar solvents.
   C. Foam works by forming a blanket of foam on the surface of burning liquid and solid fuels.
   D. Foam works by increasing the surface tension of water, making fire streams more cohesive to reach a greater distance.

5. When applied to solid fuels, Class A foam blankets the fuel, controls flames, then: (967)
   A. changes the pH of the water.
   B. expands at a ratio of 20-to-1.
   C. dissipates into the air, leaving no residue.
   D. breaks down, releasing water to cool the fuel.

6. Class B foams are especially effective on: (968)
   A. wildland and brush fires.
   B. unignited hazardous liquids.
   C. fires of ordinary combustibles.
   D. hydrocarbon fuels and polar solvents.

7. Which of the following statements about fire fighting foams is MOST accurate? (968)
   A. Proper aeration produces bubbles in a variety of sizes.
   B. Air is added to the foam solution by chemical reaction.
   C. Air is added to the foam solution by mechanical agitation.
   D. When foam bubbles dissipate, no foam remains on the surface of the fuel.
8. The degree of foam expansion depends on the type of foam concentrate, accurate proportioning, quality of the foam concentrate and:

   A. method of aeration.
   B. outside air temperature.
   C. length of discharge hose.
   D. wind direction and velocity.

9. Which classification of foam is used to suppress vapors from hazardous materials spills? (969)

   A. Low-expansion foam
   B. High-expansion foam
   C. Medium-expansion foam
   D. Minimal-expansion foam

10. High-expansion foam is typically used for:

    A. wildland and brush fires.
    B. rolling on to liquid fuel fires.
    C. suppressing vapors from hazardous materials spills.
    D. confined spaces such as mines and shipboard compartments.

11. Which of the following statements about Class A foam concentrates is MOST accurate? (971)

    A. Class A foam is used for structural fires, but is not suitable for wildland fires.
    B. Class A foam is used to prevent ignition of fires involving flammable and combustible liquids.
    C. Class A foam reduces the surface tension of water, allowing better water penetration into the fuel.
    D. Class A foam concentrate coats and protects application equipment; equipment should not be flushed after use.

12. Flammable liquids that mix readily with water are:

    A. polar solvents.
    B. viscous liquids.
    C. fluorosurfactants.
    D. hydrocarbon fuels.
13. Which Class B foams are made from a mixture of fluorosurfactants? (972)
   A. Synthetic foams
   B. Specialized foams
   C. Protein-based foams
   D. Alcohol-resistant foams

14. Which foams are required to extinguish fires of ethanol or ethanol-based fuels? (972)
   A. Class A foams
   B. Synthetic foams
   C. Protein-based foams
   D. Alcohol-resistant foams

15. Which of the following statements about foam concentrates is MOST accurate? (973)
   A. A foam blanket is of little benefit on unignited fuels.
   B. Foam application rates are different for each type of polar solvent.
   C. The minimum rate of application will be marked on the foam concentrate container.
   D. Foam should be applied in short bursts, with the operator pausing to observe its effect on the fire.

16. Why are specialized foams designed solely for use on unignited spills of hazardous liquids? (973)
   A. The roll-on method is ineffective for hazardous liquids.
   B. A thick, viscous foam can form a heat-resistant blanket over burning liquid surfaces.
   C. The US Department of Agriculture Forest Service requires specialized foams for hazardous materials.
   D. Unignited chemicals tend to change the pH of water or remove the water from fire fighting foam, making the foam ineffective.

17. Most foam concentrates are intended to be mixed with ___ percent water. (974)
   A. 0.1 to 6.0
   B. 10 to 25.5
   C. 40.5 to 50
   D. 94 to 99.9
18. Which of the following statements about foam proportioning is MOST accurate? (974)
   A. Most Class A foams are mixed in proportions of 3 to 6 percent.
   B. Most Class B foams are mixed in proportions of 1 percent or less.
   C. Mixing Class A foam at a higher recommended percentage results in a thick, dry foam.
   D. The percentage rate for proportioning foam is determined by the authority having jurisdiction.

19. Multipurpose Class B foams are normally mixed at a 6 percent rate when: (974)
   A. applied to polar solvents.
   B. applied to hydrocarbon fuels.
   C. thinner (wetter) foam is desired.
   D. fuel is burning near a body of water.

20. Factors to consider in selecting a foam proportioner include solution flow requirements, intended use, and: (974)
   A. stage of the fire.
   B. available water pressure.
   C. length of the discharge hose.
   D. proximity to bodies of water.

21. Which of the following proportioning methods depends on the Venturi Principle to draw foam through a hose connected to the foam concentrate container and into the water stream? (975)
   A. Injection
   B. Eduction
   C. Premixing
   D. Batch-mixing

22. The proportioning method which uses an external pump or head pressure to force foam concentrate into the fire stream is: (975)
   A. injection.
   B. eduction.
   C. premixing.
   D. batch-mixing.
23. Which of the following proportioning methods makes it difficult to refill an apparatus water tank due to excessive bubbling from residual foam solution? (977)
   A. Injection
   B. Eduction
   C. Premixing
   D. Batch-mixing

24. Because the foam solution goes through the pump, the ___ proportioning method may cause the pump to require additional maintenance. (977)
   A. injection
   B. eduction
   C. premixing
   D. batch-mixing

Objective 5:
Explain the advantages and disadvantages of various foam proportioners, delivery devices, and generating systems.

25. Which of the following statements about foam proportioners and delivery systems is MOST accurate? (978)
   A. The foam proportioner adds air into the foam solution to produce finished foam.
   B. The foam proportioner and delivery system must be compatible to produce usable foam.
   C. Either a foam proportioner or a foam generating system is needed to produce a foam fire stream.
   D. The foam-generating system introduces the appropriate amount of foam concentrate into the water to form foam solution.

26. Which of the following foam proportioners may compromise firefighter safety since it is difficult to quickly relocate the components? (979)
   A. In-line foam eductor
   B. Foam nozzle eductor
   C. Around-the-pump proportioner
   D. Compressed air foam system (CAFS)
27. When using an in-line eductor, which of the following might cause foam concentrations to be too lean? (979)
   A. Solid agent stick too cold to dissolve effectively.
   B. Air compressor filter clogged, dirty, or water-soaked
   C. Too little hose between eductor and discharge nozzle
   D. Foam concentrate inlet too far above surface of foam concentrate

28. Installed in-line eductors, around-the-pump proportioners, and balanced pressure proportioners are examples of: (980)
   A. portable foam proportioners.
   B. master stream delivery devices.
   C. apparatus-mounted proportioners.
   D. compressed air foam systems (CAFS).

29. Which of the following statements about compressed air foam systems (CAFS) is MOST accurate? (981)
   A. An air-aspirating nozzle adds air to the foam solution.
   B. There is little to no nozzle reaction when using CAFS.
   C. Foam produced by CAFS adheres well to vertical surfaces.
   D. Hoselines filled with CAFS are heavier than those filled with water only.

30. Which of the following statements about foam delivery devices is MOST accurate? (982)
   A. Smooth bore nozzles are used only with Class B foam.
   B. Solid agent foam concentrates may be used on Class A fires only.
   C. Fog nozzles use an apparatus-mounted air compressor to generate foam.
   D. Air-aspirating foam nozzles are the most effective appliance for generation of low-expansion foam.

31. Which of the following foam generators produces foam by pumping foam solution through the nozzle in a fine spray? (983)
   A. Fog nozzle
   B. Air-aspirating type nozzle
   C. Water-aspirating type nozzle
   D. Mechanical blower generator
32. Air-aspirating nozzles must be used with: (982)
   A. high-expansion foams.
   B. aqueous film-forming foam (AFFF).
   C. compressed air foam systems (CAFS).
   D. protein and fluoroprotein concentrates.

33. Which of the following foam generators is typically associated with total-flooding applications? (983)
   A. Fog nozzle
   B. Air-aspirating type nozzle
   C. Water-aspirating type nozzle
   D. Mechanical blower generator

Objective 6:
Identify causes of poor foam production.

34. Poor-quality foam may result from: (983)
   A. high pressure in the supply line.
   B. a short hose lay on the discharge side.
   C. air leaks at fittings causing a loss of suction.
   D. the nozzle being located too far below the eductor.

35. A common reason for generating poor-quality foam is: (983-984)
   A. equipment is older than five years.
   B. eductor and nozzle flow ratings match.
   C. nozzle remains fully open during the process.
   D. mixing different types of foam concentrate in the same tank.

Objective 7:
Distinguish among various foam application techniques.

36. In which application method does the operator direct the foam stream onto an elevated object, allowing the foam to run down and onto the surface of the fuel? (985)
   A. Roll-on method
   B. Rain down method
   C. Total-flood method
   D. Bank-down method
37. Which of the following is used only on a pool of ignited or unignited fuel on open ground? (984)
   A. Roll-on method
   B. Rain down method
   C. Total-flood method
   D. Bank-down method

38. Which of the following is the primary application technique used on aboveground storage tank fires? (985)
   A. Roll-on method
   B. Rain down method
   C. Total-flood method
   D. Bank-down method

Objective 8: Identify foam hazards and ways to control them.

39. Which of the following statements about foam hazards is MOST accurate? (985)
   A. Never flush foam concentrates from exposed skin.
   B. Some foam concentrates and their vapors may be harmful if inhaled.
   C. There is no need to flush or wash equipment that has been used to apply foam.
   D. Most Class A and Class B foams act to lubricate and preserve pumps, eductors, and other equipment.

40. Which of the following statements about finished foam in the environment is MOST accurate? (986)
   A. Generally, protein-based foams are a greater environmental hazard than other types of foam.
   B. Manufacturers’ safety data sheets (SDS) do not contain environmental impact information.
   C. In a body of water, decomposing foam can reduce oxygen available to fish and other aquatic creatures.
   D. In the United States, Class A foams should be approved by the U.S. Fish and Wildlife Service for environmental safety.