Chapter 15 Quiz

Name: ____________________________ Date: _______________________

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

1. Which category of preperformance tests are fire department personnel MOST likely to be involved in? (516)
   A. Design tests
   B. Acceptance tests
   C. Certification tests
   D. Manufacturers’ tests

2. What two tests are MOST likely to be included in manufacturer’s tests? (516)
   A. Road test and hydrostatic test
   B. Hydrostatic test and vacuum test
   C. Engine speed check and vacuum test
   D. Road test and engine speed interlock test

3. When is pump certification testing conducted? (517)
   A. After one year of continuous service
   B. Before final acceptance of the vehicle
   C. After six months of continuous service
   D. Directly after delivery to the purchaser

4. Which kind of test is conducted to demonstrate to the purchaser that the apparatus conforms to all bid specifications at the time of delivery? (517)
   A. Acceptance testing
   B. Finalization testing
   C. Certification testing
   D. Manufacturers’ testing
5. According to NFPA® 1911, how often should a pumper be performance tested? (518)
   A. At least once a month
   B. At least once a year
   C. Every two years
   D. Every five years

6. Which formula would be used when correcting net pump discharge? (521)
   A. Pressure correction formula
   B. Discharge pressure loss formula
   C. Intake hose friction loss formula
   D. Conductivity comparison formula

7. The engine speed check should be conducted under what type of conditions? (523)
   A. No-load
   B. Uneven terrain
   C. Maximum load
   D. Inclement weather

8. Which performance test evaluates the overall operation of the engine and the fire pump? (524)
   A. Pumping test
   B. Priming system test
   C. Pressure control test
   D. Tank-to-pump flow test

9. Which method tests the calibration accuracy of a foam proportioning system? (527)
   A. Foam solution displacement method
   B. Foam concentrate displacement method
   C. Foam solution discharge volume method
   D. Foam concentrate measurement method
Directions: Write a brief answer to the questions below.

10. Briefly discuss the actions that should be taken if an apparatus fails to perform to requirements outlined in the bid specifications. (517-518)

11. List three safety considerations for personnel while service testing fire pumps. (522-523)
12. List four issues that should be investigated before any results are concluded if a pump fails to meet the requirements of the service test. (526-527)
Chapter 15 Test

Name: ____________________________ Date: ____________________________

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

Objective 1: Distinguish among preperformance tests for pumping apparatus.

1. Which standard is commonly used as a basis for most apparatus bid specifications? (516)
   A. NFPA® 1500
   B. NFPA® 1521
   C. NFPA® 1901
   D. NFPA® 1931

2. When road tests are conducted as part of manufacturers’ testing, what type of conditions should be present? (516)
   A. Flat, dry, paved roads in good condition
   B. Flat, dry, unpaved roads in good condition
   C. Both flat and hilly roads, regardless of condition
   D. A mixture of paved and unpaved roads in good condition

3. If a jurisdiction seeks special requirements from the manufacturer to ensure that the apparatus will perform as required under local conditions, they may be written into the bid specifications as: (516)
   A. recommendations.
   B. policies and procedures.
   C. engineering specifications.
   D. performance requirements.
4. What is MOST likely to happen if an apparatus fails to comply with bid specifications? (517)
   A. The apparatus will be rejected by the purchaser.
   B. The manufacturer will offer the apparatus at a reduced price.
   C. All apparatus-mounted equipment will be replaced before retesting.
   D. The failure will be documented and the apparatus will be placed into service.

5. What is the maximum speed that must be reached by apparatus during road tests? (516)
   A. 40 mph (65 km/h)
   B. 50 mph (80 km/h)
   C. 60 mph (95 km/h)
   D. 70 mph (110 km/h)

6. Which test is performed to ensure that the pumps and associated piping are capable of withstanding high pressure pumping demands? (517)
   A. Hydrostatic testing
   B. Hydrophobic testing
   C. Pumping output testing
   D. Pumping overload testing

7. Who is in charge of performing pump certification tests? (517)
   A. Driver/operators
   B. Apparatus mechanics
   C. Manufacturer representatives
   D. Independent testing organizations

8. The engine speed interlock test is part of which category of preperformance tests? (517)
   A. Acceptance tests
   B. Manufacturers’ tests
   C. Pump certification tests
   D. Engineering system tests
9. What is the purpose of acceptance testing? (517)
   A. To ensure that driver/operators are well qualified to operate all onboard apparatus equipment
   B. To demonstrate to the purchaser that the apparatus conforms to all bid specifications at the time of delivery
   C. To ensure that pumps and associated piping are capable of withstanding high pressure pumping demands
   D. To allow purchasers to test multiple apparatus models and accept the model that best suits their jurisdictional needs

10. Pump testing should be performed: (517)
    A. only during acceptance testing.
    B. only during certification testing.
    C. both certification tests and road tests.
    D. both acceptance tests and certification tests.

11. Which test is more important for jurisdictions located at least 2,000 ft (600 m) above sea level? (518)
    A. Onboard tank capacity test
    B. Onboard tank overload test
    C. Priming system overload test
    D. Pumping engine overload test

Objective 2:
Summarize facts about performance testing of fire pumps.

12. In addition to yearly testing as required by NFPA® 1911, when should pumper performance be tested? (518)
    A. After any major incident involving multiple jurisdictions
    B. Whenever an oil change or other routine maintenance is done
    C. If the apparatus operates during extreme temperature conditions
    D. Whenever the apparatus has undergone major pump or powertrain repair
13. Which test is included in the minimum requirements of NFPA® 1901 for apparatus performance testing? (518)
   A. Overload test  
   B. Overdrive test  
   C. Hydrostatic test  
   D. Primer control test

14. When conducting pump performance tests using a static water source, how deep must the water be? (518)
   A. 4 ft (1.2 m)  
   B. 6 ft (1.8 m)  
   C. 8 ft (2.4 m)  
   D. 10 ft (3.0 m)

15. When conducting pumper performance testing, the air temperature should always be above: (518)
   A. 0°F (-18°C).  
   B. 10°F (-12°C).  
   C. 25°F (-4°C).  
   D. 32°F (0°C).

16. Which factor would be MOST important to consider when correcting net pump discharge pressure for apparatus testing? (519)
   A. Pump capacity  
   B. Age of the apparatus  
   C. Diameter of the intake hose  
   D. Friction loss in the intake hose

17. According to NFPA® 1911, all gauges used for service testing must be calibrated within _____ of testing. (521)
   A. 30 days  
   B. 60 days  
   C. 6 months  
   D. 12 months
18. A pitot tube is required if a ___ is not used during performance testing. (522)
   A. flowmeter
   B. stop watch
   C. pitot clamp
   D. gauge stand

19. If a flowmeter is used during performance testing, what piece of equipment may be used in place of smooth bore nozzles? (522)
   A. Fog nozzles
   B. Any handline nozzle
   C. Master stream nozzles
   D. Air aspirating foam nozzles

20. A flowmeter might be used instead of a pitot gauge during a pump performance test, because flowmeters are: (522)
   A. more efficient.
   B. more accurate.
   C. less expensive.
   D. easier to operate.

21. During service testing, personnel should operate the engine throttle slowly in order to help prevent which potentially dangerous situation from occurring? (523)
   A. Sudden speed changes
   B. Gradual speed changes
   C. Sudden pressure changes
   D. Gradual pressure changes

22. Which dangerous substance should be monitored for during service testing? (523)
   A. Sulfur dioxide
   B. Carbon dioxide
   C. Hydrogen sulfide
   D. Carbon monoxide
23. What piece of equipment is used to determine engine speed during performance testing? (523)
   A. Flow meter
   B. Pitot gauge
   C. Tachometer
   D. Speedometer

24. Which pieces of equipment are evaluated for air leaks using a vacuum test? (523)
   A. Priming device, pump, and intake hose
   B. Priming device, pump, and output hose
   C. Onboard water tank seals and intake hose
   D. Onboard water tank seals and priming device

25. What should be done if the pump fails to reach 22 inches of mercury (-75 kPa) during the vacuum test? (523)
   A. Immediately retest the apparatus a second time.
   B. Document the test results and retest within two weeks.
   C. Immediately contact the manufacturer’s representative.
   D. Remove the apparatus from service until repairs can be made.

26. For a pumper with a 1,250 gpm (5 000 L/min) capacity, how quickly must it achieve prime during the priming system performance test? (524)
   A. 15 seconds or less
   B. 30 seconds or less
   C. 1 minute or less
   D. 2 minutes or less

27. Which test is performed in a three-part sequence and may be completed while the pump is still set up after the pumping test? (525)
   A. Priming system test
   B. Pressure control test
   C. Tank-to-pump flow test
   D. Flowmeter operational test
28. When conducting discharge pressure gauge and flowmeter operational tests, a difference in readings between the flowmeter and pitot gauge must not be more than: (525)
   A. 10 percent.
   B. 20 percent.
   C. 30 percent.
   D. 40 percent.

29. Which test verifies that the piping between the onboard tank and pump is sufficient to supply the minimum amount of water as specified by NFPA® 1901 and the design of the manufacturer? (525)
   A. Priming system test
   B. Pressure control test
   C. Tank-to-pump flow test
   D. Discharge pressure gauge test

30. During the tank-to-pump flow test, pumpers with an onboard capacity of greater than 500 gallons (2 000 L) must be capable of flowing at least: (526)
   A. 100 gpm (400 L/min).
   B. 200 gpm (800 L/min).
   C. 300 gpm (1 200 L/min).
   D. 500 gpm (2 000 L/min).

31. Which apparatus performance tests require that a discharge hoseline from a second pumper be connected to the apparatus being tested? (526)
   A. Priming system test
   B. Tank-to-pump flow test
   C. Internal intake pressure relief valve test
   D. Discharge pressure gauge and flowmeter operational tests
32. When completing performance testing, what is MOST likely to happen if an apparatus achieves results of less than 90 percent of its originally rated capabilities? (526)

A. It will be placed out of service and restored to its original capabilities.
B. It will be documented as out of service but kept for training purposes.
C. It will be given a higher rating based on the results of the most recent testing.
D. It will be permanently placed out of service and replaced with a new apparatus.

Objective 3:
Describe methods for testing a foam proportioning system.

33. Foam proportioning equipment testing should occur before being placed in service and: (527)

A. after each use.
B. periodically thereafter.
C. only if the foam seems ineffective.
D. when the type of foam is changed.

34. Which foam proportioner test checks the volume of foam concentrate that is drawn through the system? (527)

A. Foam solution refractivity test
B. Foam solution conductivity test
C. Foam concentrate displacement method
D. Foam concentrate pump discharge volume method

35. Which foam proportioner test discharges foam at a predetermined flow into a calibrated tank for a specific period of time? (528)

A. Foam solution refractivity test
B. Foam solution conductivity test
C. Foam concentrate displacement method
D. Foam concentrate pump discharge volume method
36. Which foam proportioner test measures the velocity of light that travels through foam and compares it to a base reading? (528)
   A. Foam solution refractivity test
   B. Foam solution conductivity test
   C. Foam concentrate displacement method
   D. Foam concentrate pump discharge volume method

37. Which foam proportioner test verifies the ability of the foam product to conduct electricity? (529)
   A. Foam solution refractivity test
   B. Foam solution conductivity test
   C. Foam concentrate displacement method
   D. Foam concentrate pump discharge method
Chapter 15 Quiz Answers

1. B
2. A
3. B
4. A
5. B
6. A
7. A
8. A
9. B
10. Answers may vary; students should include some of the following:
    • It should be rejected by the purchaser. Provisions may be made to allow the manufacturer the opportunity to correct any deficiencies or supply another apparatus that will fit the specifications, or depending on the contract the purchaser may consider the order void and choose another vendor.

12. Answers may vary; students should include at least three of the following:
    • Wear protective head gear, eyewear, gloves, and hearing protection if noise levels have the potential to reach or exceed 90 decibels (dB)
    • Open and close valves and nozzles slowly to prevent water hammer
    • Operate the engine throttle slowly to prevent sudden pressure changes that may damage equipment or injure personnel
    • Secure test nozzles and observe hose from a safe distance
    • Ensure no people or obstructions are in the path of a hose stream
    • Be sure personnel are protected from any open manholes if using a test pit
    • Chock apparatus wheels
    • Monitor air quality for the presence of carbon monoxide

13. Answers may vary; students should include at least four of the following:
    • Transmission in wrong gear
    • Lockup clutch with automatic transmission apparatus not functioning
    • Clutch slipping
    • Engine overheating
    • Muffler clogged
    • Tachometer inaccurate
    • Engine governor malfunctioning
    • Insufficient intake hose
    • Intake strainer submerged incorrectly or intake screen clogged
    • Lift higher than 10 feet (3 m)
    • Intake hose clogged or lining collapsed
    • Excessive air leaks on intake side of pump as a result of bad pump seals
- Pump impellers clogged
- Clearance rings that are excessively worn
- Pump or intake hose not fully primed
- Malfunctioning relief valve or pressure governor
- Transfer valve in wrong position
- Malfunction of gauges
- Pitot gauge malfunctioning or clogged
- Nozzle too large or too small
Chapter 15 Test Answers

Objective 1
1. C
2. A
3. D
4. A
5. B
6. A
7. D
8. C
9. B
10. D
11. D

Objective 2
12. D
13. A
14. A
15. A
16. D
17. B
18. A
19. A
20. A
21. C
22. D
23. C
24. A
25. D
26. B
27. B
28. A
29. C
30. D
31. C
Objective 3

33. B
34. C
35. D
36. A
37. B