

Study Guide

For

West Virginia Underground Storage System Installation and Repair Certification (Class A)

This Document has been prepared in conjunction with the West Virginia Department of
Environmental Protection by:
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January 2013

Suggestions for Using This Study Guide

This study guide is intended to help you prepare for West Virginia's Underground Storage Tank Class A System Installation and Repair Certification Exam. The study guide consists of an extensive list of questions together with the documents in which the answers to the questions can be found. All of the questions from a specific document are grouped together in the study guide. After each question, the document section or page number where the answer can be found is given in parentheses. The process of reading the question, finding the answer, and writing the answer in your study guide will help you learn and remember the information you need to know to pass the certification examination.

The study guide has been divided into two sections: "primary" study documents and "secondary" study documents. The primary documents are used for an overview of particular topics, while secondary documents are used for specific equipment used on a particular storage system. It is recommended that you study the "primary" study documents first, followed by the secondary study documents. Please note that there may be cases where different documents may have conflicting information. In such cases, the document referenced by the question is considered the correct answer. Information on obtaining study guide materials is provided on pages v through vii of this document.

The actual certification exam will include only the material covered in these study questions, with the majority of the questions coming from the primary study documents. The only difference is that the exam will be in multiple choice and true / false question formats. The exam will be open book. During the examination, you may refer to this study guide and any other reference materials that you wish. You are cautioned, however, that you will not have sufficient time to look up the answers to all of the exam questions. You should be thoroughly familiar with the materials in this study guide before you take the examination.

The study guide is based on a number of industry publications and manufacturers' literature. The use of these documents does not constitute endorsement of specific tank or piping products by the West Virginia Department of Environmental Protection. These documents are used here as representative, authoritative sources of information regarding the proper installation and repair of underground storage systems.

**Suggested Study Guide Documents for the West Virginia
Underground Storage Tank Installation and Repair Certification Exam
(Class A Worker Certification)**

Primary Study Documents

PEI/RP100-11 “Recommended Practices for Installation of Underground Liquid Storage Systems”, 2011 (Petroleum Equipment Institute)

API Recommended Practice 1615 “Installation of Underground Petroleum Storage Systems”, Sixth Edition, April 2011 (American Petroleum Institute)

PEI/RP1200-12 “Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment at UST Facilities”, 2012 (Petroleum Equipment Institute)

API Recommended Practice 1626 “Storage and Handling Ethanol and Gasoline-ethanol Blends at Distribution Terminals and Filling Stations”, Second Edition, August 2010 - Errata, February 2011 (American Petroleum Institute)

API Recommended Practice 1632 “Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems”, Third Edition, May 1996 – Reaffirmed December 2010 (American Petroleum Institute)

API Recommended Practice 1631 “Interior Lining and Periodic Inspection of Underground Storage Tanks”, Fifth Edition, June 2001 – Reaffirmed December 2010 (American Petroleum Institute)

Federal Underground Storage Tank Regulations: 40 CFR 280 “Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)”

West Virginia Underground Storage Tank Rule, Title 33, Series 30

National Leak Prevention Association Standard 631, "Entry, Cleaning, Interior Inspection, Repair, and Lining of Underground Storage Tanks"

Occupational Safety and Health Administration (OSHA) “Safety and Health Regulations for Construction – Excavations” 29 CFR Subpart P, 1926.650 - 652

National Fire Prevention Association, NFPA 30 “Flammable and Combustible Liquids Code” (Chapter 23 “Storage of Liquids in Tanks”) and NFPA 30A “Code for Motor Fuel

Dispensing Facilities and Repair Garages” (Chapter 5 “Piping for Liquids”, Chapter 6 “Fuel Dispensing Systems”, Chapter 8 “Electrical Installations”) (2012 Edition)

West Virginia Department of Environmental Protection “Secondary Containment Guidance Document”

Secondary Study Documents

40 CFR 63, Subpart 63 “National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities”

Steel Tank Institute “Cathodically Protected Underground Storage Tanks” Installation Instructions, Publication R821, June 2010

Steel Tank Institute “FRP Composite Steel Underground Storage Tanks” Installation Instructions, Publication 913, June 2010

Steel Tank Institute “FRP Jacketed Steel Underground Storage Tanks” Installation Instructions, Publication 923-10, June 2010

Containment Solutions “Fiberglass Storage Tanks” Installation Instructions

Xerxes “Installation Manual and Operating Guidelines for Fiberglass Underground Storage Tanks”

Fiber Glass Systems “Red Thread IIA Piping System: General Installation Instructions”, Manual B2160, October 1, 2008 (formerly Smith Fiberglass Products, now Smith FiberCast)

Ameron International Dualoy 3000/L Installation “Installation Practices for Secondary Containment Piping Systems”, Bulletin 8702, FP264J, November 2007

OPW Fueling Containment Systems “Flexible Underground Piping Manual”, Publication UPM-0001, Issue Date 4/28/11

Franklin Fueling Systems “UPP Piping Installation Guide Overview”

Franklin Fueling Systems “XP Installation Guide Overview”, Manual 771-232-00, Revision 7, March 2012 (includes APT piping brand)

Study Guide Material Information

It is highly recommended that you obtain a copy of each of the study guides to review prior to taking the examination. Some of the study guides are free publications, and are being provided as a courtesy to you by the WVDEP. For study guides that must be purchased, we have included information on where they can be obtained. Please note that information on purchasing study guide materials may change at any time. For this reason the purchasing information provided may not be correct. **It is the sole responsibility of the applicant to obtain the necessary study guide materials to prepare for this exam.**

PEI/RP100-11 “Recommended Practices for Installation of Underground Liquid Storage Systems”, 2011 (Petroleum Equipment Institute)

-Must be purchased from Petroleum Equipment Institute, P.O. Box 2380, Tulsa, OK 74101
Phone 918/494-9696 <http://www.pei.org>, see “Publications & Resources” tab

API Recommended Practice 1615 “Installation of Underground Petroleum Storage Systems”, Sixth Edition, April 2011 (American Petroleum Institute)

-Must be purchased, One option is the IHS Standards Store at <http://global.ihs.com>, enter API RP 1615 to search for document

PEI/RP1200-12 “Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment at UST Facilities”, 2012 (Petroleum Equipment Institute)

-Must be purchased from Petroleum Equipment Institute, P.O. Box 2380, Tulsa, OK 74101
Phone 918/494-9895 <http://www.pei.org>, see “Publications & Resources” tab

API Recommended Practice 1626 “Storage and Handling Ethanol and Gasoline-ethanol Blends at Distribution Terminals and Filling Stations”, Second Edition, August 2010 - Errata, February 2011 (American Petroleum Institute)

-Must be purchased, one option is the HIS Standards Store at <http://global.ihs.com>, enter API RP 1626 to search for document

API Recommended Practice 1632 “Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems”, Third Edition, May 1996 – Reaffirmed December 2010 (American Petroleum Institute)

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API Recommended Practice 1631 “Interior Lining and Periodic Inspection of Underground Storage Tanks”, Fifth Edition, June 2001 – Reaffirmed December 2010 (American Petroleum Institute)

-Must be purchased, one option is the HIS Standards Store at <http://global.ihs.com>, enter API RP 1631 to search for document

Federal Underground Storage Tank Regulations: 40 CFR 280 “Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)”

-Free document, provided by the WVDEP

West Virginia Underground Storage Tank Rule, Title 33, Series 30
-Free document, provided by the WVDEP

National Leak Prevention Association Standard 631, "Entry, Cleaning, Interior Inspection, Repair, and Lining of Underground Storage Tanks"
-Must be purchased from National Leak Prevention Association, available at:
<http://www.nlpa-online.org/standards.html> Phone 815/301-2785

Occupational Safety and Health Administration (OSHA) "Safety and Health Regulations for Construction – Excavations" 29 CFR Subpart P, 1926.650 – 652
-Free document, provided by WVDEP

National Fire Prevention Association, NFPA 30 "Flammable and Combustible Liquids Code" (Chapter 23 "Storage of Liquids in Tanks") and NFPA 30A "Code for Motor Fuel Dispensing Facilities and Repair Garages" (Chapter 5 "Piping for Liquids", Chapter 6 "Fuel Dispensing Systems", Chapter 8 "Electrical Installations") (2012 Edition)
-Must be obtained from the National Fire Protection Association, available at:
<http://www.nfpa.org/>, see "Codes & Standards" tab, or phone 800-344-3555 for customer sales

West Virginia Department of Environmental Protection "Secondary Containment Guidance Document"
-Free document, provided by the WVDEP

40 CFR 63, Subpart 63 "National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities"
-Free document, provided by the WVDEP

Steel Tank Institute "Cathodically Protected Underground Storage Tanks" Installation Instructions, Publication R821, June 2010
-Must be obtained from the Steel Tank Institute, available at: <http://www.steeltank.com>, or contact Steel Tank Membership Communications, 847/438-8265, ext. 233

Steel Tank Institute "FRP Composite Steel Underground Storage Tanks" Installation Instructions, Publication 913, June 2010
- Must be obtained from the Steel Tank Institute, available at: <http://www.steeltank.com>, or contact Steel Tank Membership Communications, 847/438-8265, ext. 233

Steel Tank Institute "FRP Jacketed Steel Underground Storage Tanks" Installation Instructions, Publication 923-10, June 2010
- Must be obtained from the Steel Tank Institute, available at: <http://www.steeltank.com>, or contact Steel Tank Membership Communications, 847/438-8265, ext. 233

Containment Solutions "Fiberglass Storage Tanks" Installation Instructions
-Free document, provided by the WVDEP

Xerxes "Installation Manual and Operating Guidelines for Fiberglass Underground Storage Tanks"
-Free document, provided by the WVDEP

Fiber Glass Systems “Red Thread IIA Piping System: General Installation Instructions”, Manual B2160, October 1, 2008 (formerly Smith Fiberglass Products, now Smith FiberCast)

-Free document, provided by the WVDEP

Ameron International Dualoy 3000/L Installation “Installation Practices for Secondary Containment Piping Systems”, Bulletin 8702, FP264J, November 2007

-Free document, provided by the WVDEP

OPW Fueling Containment Systems “Flexible Underground Piping Manual”, Publication UPM-0001, Issue Date 4/28/11

-Free document, provided by the WVDEP

Franklin Fueling Systems “UPP Piping Installation Guide Overview”

-Free document, provided by the WVDEP

Franklin Fueling Systems “XP Installation Guide Overview”, Manual 771-232-00, Revision 7, March 2012 (includes APT piping brand)

-Free document, provided by the WVDEP

**PEI/RP100-11 “Recommended Practices for Installation of Underground
Liquid Storage Systems”
(Petroleum Equipment Institute, 2011)**

*(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair
Certification Exam)*

1. What is the proper way to move a tank?
(PEI/RP100-11, Section 2.2)

2. When two lifting lugs are used, the angle between the lifting cable and vertical should be no more than ____?
(PEI/RP100-11, Section 2.2)

3. Before any attempt to move tanks is made, establish that ___?_ has sufficient capacity and reach to lift and lower the tanks.
(PEI/RP100-11, Section 2.2)

4. When performing pre-installation tank testing what should be performed?
(PEI/RP100-11, Section 3.2)

5. When performing a pre-installation air test what should be done to prevent over-pressurization?
(PEI/RP100-11, Section 3.2)

6. What is the maximum test pressure for tanks less than 12 ft. in diameter?
(PEI/RP100-11, Section 3.2, 3.3)

7. What is the space between the inner and outer tank wall called?
(PEI/RP100-11, Section 3.3)

8. A double wall tank is delivered to the site with a vacuum on the interstice. The vacuum gauge indicates a level below the minimum level set by the manufacturer. Who should be contacted?
(PEI/RP100-11, Section 3.7)

9. Which of the following factors aggravate excavation problems?
(PEI/RP100-11, Section 4.1)

10. Which of the following factors should be considered when determining the slope to be used for the excavation walls?
(PEI/RP100-11, Section 4.1)

11. PEI/RP100 recommends that tanks be set on backfill material at least ? thick.
(PEI/RP100-11, Section 4.3)

12. PEI/RP100 recommends that at least how much backfill material should be between the tanks?
(PEI/RP100-11, Section 4.3)

13. PEI/RP100 recommends that at least how much backfill material should be between the tanks and the excavation walls?
(PEI/RP100-11, Section 4.3)

14. Under what conditions are placing a tank directly on a hold-down pad permitted?
(PEI/RP100-11, Section 4.3)

15. Paving over tanks in traffic areas should extend how far beyond the perimeter of the tank excavation?
(PEI/RP100-11, Section 4.4)

16. PEI/RP100-11 recommends, in areas where fully loaded product transport vehicles are likely to pass over the tank area, that the reinforced concrete over the tank be at least how thick?
(PEI/RP100-11, Section 4.4)

17. According to PEI/RP100-11, how is the maximum burial depth of a tank measured?
(PEI/RP100-11, Section 4.6)

18. According to PEI/RP100-11, what is the standard maximum burial depth for a fiberglass tank?
(PEI/RP100-11, Section 4.6)

19. According to PEI/RP100-11, what is the maximum burial depth for steel tanks?
(PEI/RP100-11, Section 4.6)

20. How far from the edge of the tank excavation should excavated material that cannot be immediately removed be stockpiled?
(PEI/RP100-11, Section 4.7)

21. What are common deficiencies that adversely affect the structural integrity and coatings of tanks?
(PEI/RP100-11, Section 5.1)

22. What does PEI/RP100-11 state are the "standard" backfill materials for fiberglass tanks?
(PEI/RP100-11, Section 5.6)

23. When installing fiberglass tanks, the bottom of the excavation should be covered by a minimum of ___ of suitable graded and compacted backfill material?
(PEI/RP100-11, Section 5.7)

24. According to PEI/RP100-11, when sand is used as a backfill, what is the recommended compaction specification?
(PEI/RP100-11, Section 5.8)
25. Why is measuring the deflection of fiberglass tanks important?
(PEI/RP100-11, Section 5.9)
26. What is the purpose of filter fabric in a tank excavation?
(PEI/RP100-11, Section 5.10)
27. For the purpose of calculating tank burial depth, 1 inch of reinforced concrete over the tank is equivalent to how many inches of compacted backfill?
(PEI/RP100-11, Section 6.1)
28. Where must "deadman" anchors be placed to be effective?
(PEI/RP100-11, Section 6.4)
29. What are the minimum dimensions for a bottom hold down anchorage pad?
(PEI/RP100-11, Section 6.4)
30. When installing a bottom hold down pad what factors must be calculated for each installation?
(PEI/RP100-11, Section 6.4)
31. When should vent restriction devices, often referred to as "ball float valves" **not** be installed on a UST system?
(PEI/RP100-11, Section 7.3.3)

32. What components should a monitoring well contain?
(PEI/RP100-11, Section 9.2.2 and Figure 9-1)

33. When sensors are used for leak detection in dispenser sumps, where should the sensors be installed?
(PEI/RP100-11, Section 8.7)

34. Galvanized product piping is allowed on piping containing which products?
(PEI/RP100-11; 10.2)

35. What is the minimum distance between product pipes in a trench?
(PEI/RP100-11, Section 10.4)

36. What is the minimum distance between the piping and the trench excavation walls?
(PEI/RP100-11, Section 10.4, Fig. 10-1)

37. What is the minimum distance in a piping trench between a conduit and the piping in the trench?
(PEI/RP100-11, Section 10.4, Fig. 10-1)

38. Shear Valves are used on which types of systems?
(PEI/RP100-11, Section 10.16)

39. When should new product piping and storage systems be tested?
(PEI/RP100-11, Section 11.1)

40. What material should aboveground vent risers be constructed of?
(PEI/RP100-11, Section 10.12)

41. What material should **not** be used for fill-pipe risers?
(PEI/RP100-11, Section 10.13)

42. Which codes apply to electrical equipment installed at UST sites?
(PEI/RP100-11, Section 13.2)

43. Sloping for vent piping should be no less than ? per foot back to the tank.
(PEI/RP100-11, Section 10.12)

44. What is the name of the sumps used for reason of extending existing piping systems and creating branches in piping?
(PEI/RP100-11, Section 8.6)

45. What fitting should be installed at the tank connection on vent lines to facilitate future testing?
(PEI/RP100-11, Section 10.12)

46. When working on electrical equipment at UST site which OSHA Regulation is applicable in most cases?
(PEI/RP100-11, Section 13.2)

47. PEI/RP 100-11 indicates flex connectors can be installed at what specific locations?
(PEI/RP100-11, Section 10.6)

48. When installing steel piping runs, what are minimum standards and procedures that PEI/RP100-11 recommends should be followed?
(PEI/RP100-11, Section 10.8)

API Recommended Practice 1615 “Installation of Underground Petroleum Storage Systems” – Sixth Edition, April 2011

(American Petroleum Institute)

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. A site-specific Preconstruction Plan should include what specific details?
(API RP 1615, Section 6.1.1)

2. Identify the various factors that can affect the size and shape of the UST system installation.
(API RP 1615, Section 8.1)

3. Why should areas with open trenches and excavations be barricaded?
(API RP 1615, Section 8.2)

4. Tanks should be located to minimize the amount of maneuvering necessary for the tank truck delivering product. Factors to be considered when locating tanks include?
(API RP 1615, Section 8.3.1)

5. As part of a fiberglass-reinforced plastic (FRP) tank installation, the deflection of the tank must be documented. What is deflection?
(API RP 1615, Section 9.2.4)

6. Identify the various factors to be considered when pressure testing double-wall tanks.
(API RP 1615, Section 9.6.2)

7. When moving tanks on site to prepare for installation, a "restricted access" exclusion zone should be established that considers what factors?
(API RP 1615, Section 10.1.1)

8. Each tank has a maximum potential buoyancy that must be offset by overburden. What are types of overburden identified in API RP 1615?
(API RP 1615, Section 10.2.1)

9. When using anchoring straps on steel tanks, straps should have what characteristics to be electrically isolated from the steel tank surface?
(API RP 1615, Section 10.3.5)

10. For both steel and FRP (fiberglass reinforced plastic) tanks, API RP 1615 recommends during the backfilling process that the height of the ballest in the tank never exceed __?__ feet above the level of backfill around the tank.
(API RP 1615, Section 10.4.2)

11. For underground piping, AP RP 1615 recommends placement of underground warning tape at what location?
(API RP 1615, Section 11.3.2)

12. For tanks not subject to vehicular traffic, what should cover materials consist of?
(API RP 1615, Section 11.4)

13. For tanks subject to vehicular traffic, identify allowable cover materials consist and associated placement requirements?
(API RP 1615, Section 11.4)

14. For FRP (fiber reinforced plastic) tanks, after backfilling is complete and before concrete or asphalt paving activities, the inside vertical diameter of the tank should be measured. Why?
(API RP 1615, Section 11.6)

15. For suction pumping systems, what factors can contribute to the overall product lifting height?
(API RP 1615, Section 12.3.2)

16. Drop tubes should be extended to within __?__ inches of the tank bottom.
(API RP 1615, Section 12.5.5)

17. What important identification information should be placed on fill assemblies, manway covers, under the street lids, and related locations?
(API RP 1615, Section 12.6)

18. Vent piping on a tank should be a minimum of 18 inches below grade for unpaved areas, and __?__ inches below grade for paved areas.
(API RP 1615, Section 13.3.2)

19. What type of piping should normally be used for tank venting?
(API RP 1615, Section 13.3.3)

20. Vent piping must discharge upward, at a discharge point a minimum of __?__ feet above the adjacent ground surface.
(API RP 1615, Section 13.3.3)

21. At retail gasoline dispensing facilities with a monthly throughput of 100,000 gallons or more, pressure vacuum (P/V) vent valves must be installed on each tank. Identify the appropriate pressure settings.
(API RP 1615, Section 13.3.4)

22. Steel piping used in conjunction with tanks should have what specific characteristics?
(API RP 1615, Section 13.5)

23. API RP 1615 recommends manufactured flexible connectors be installed in secondary containment situations. Identify these situations.
(API RP 1615, Section 13.7.4)

24. When double wall piping is being used and a pipe tightness test is to be conducted, API RP 1615 recommends, unless specified otherwise by the piping manufacturer, that the outer pipe be tested using what pressure?
(API RP 1615, Section 13.8)

25. API RP 1615 Spill containment and overflow protection are required by what regulations?
(API RP 1615, Section 14.1)

26. Overfill prevention equipment must be installed to meet what specific criteria?
(API RP 1615, section 14.2.2)

27. Sacrificial Anode Systems protects steel equipment using a _?_ reactive metal than steel.
(API RP 1615, Section 15.2.1)

28. Stage I Vapor Recovery refers to vapors being recovered during what activity?
(API RP 1615, Section 17.1.2)
29. Stage I Vapor Recovery using the Two-Point Balance System uses a vapor pickup adapter that must have a ___ valve that is closed when the vapor pickup hose is not connected.
(API RP 1615, Section 17.2.2.2)
30. Identify the various types of Stage II Vapor Recovery Systems?
(API RP 1615, Section 17.3.2.1, 17.3.2.2)
31. API RP 1615 states that release detection of tanks and piping is required by what regulations?
(API RP 1615, Section 18.1)
32. When performing a line tightness test on a pressurized piping system, the testing must be capable of detecting ___ leak rate from any portion of the piping that routinely contains product at one and one-half times the operating pressure.
(API RP 1615, Section 18.3.2.1)
33. Automatic line leak detectors, or ALDs, are required for all pressurized piping systems, and must be able to detect a ___ leak from any portion of the piping at 10 psi within one hour.
(API RP 1615, Section 18.3.5)
34. Any release detection methods must, at a minimum, be capable of detecting a 0.2 gph release with a Pfa/Pd of 95/5. What is Pfa/Pd?
(API RP 1615, Section 2.71 and 2.72 referenced in Section 18.3.4 and 18.4.2)

PEI/RP 1200-12 “Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment at UST Facilities”

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. The recommended practices found within PEI 1200 apply to what types of facilities and installations?
(PEI/RP 1200-12, Section 1.4)

2. The recommended practices found within PEI 1200 **do not** apply to what types of facilities and installations?
(PEI/RP 1200-12, Section 1.4)

3. An area classified as a Class I, Division 1 by the National Fire Protection Association in its National Fire Code describes what specific areas?
(PEI/RP 1200-12, Section 2.8)

4. What is a liquid-tight structure installed around the primary tank, piping or other component of a storage system that is designed to contain a leak from the primary containment?
(PEI/RP 1200-12, Section 2.34)

5. What safety precautions should be observed when working in any area where fuel vapors may be present?
(PEI/RP 1200-12, Section 3.4)

6. Name the two methods for testing the integrity of tank secondary containment systems?
(PEI/RP 1200-12, Section 4.1)

7. When performing a “dry” Tank Secondary Containment Integrity Test using a vacuum on a fiberglass tank, what’s the vacuum pressure to be “pulled”?
(PEI/RP 1200-12, Section 4.2.8)

8. When performing a "dry" Tank Secondary Containment Integrity Test using a vacuum on a steel tank, what's the vacuum pressure to be "pulled"?
(PEI/RP 1200-12, Section 4.2.8)
9. While performing a "dry" Tank Secondary Containment Integrity Test using a vacuum, liquids were drawn into the interstitial space. Does this test pass or fail?
(PEI/RP 1200-12, Section 4.2.9)
10. Identify test conditions to be met when performing a liquid-filled Tank Secondary Containment Integrity test.
(PEI/RP 1200-12, Section 4.3.4)
11. When performing a liquid-filled Tank Secondary Containment Integrity test, what test equipment is required?
(PEI/RP 1200-12, Section 4.3.8)
12. When performing Secondary Containment Integrity Testing of piping, an inert gas source must be available. What inert gases can be used?
(PEI/RP 1200-12, Section 5.6)
13. When performing Secondary Containment Integrity Testing of piping, the interstitial space is gradually pressurized to what pressure?
(PEI/RP 1200-12, Section 5.7)
14. When performing Secondary Containment Integrity Testing of piping, how long must the interstitial area be pressurized with no pressure change in order for the test to be considered passing?
(PEI/RP 1200-12, Section 5.7)
15. When performing Spill Bucket Integrity Testing using the Hydrostatic Test Method, what fluid should be used?
(PEI/RP 1200-12, Section 6.2)

16. When performing Spill Bucket Integrity testing using the Hydrostatic Test Method, where should the measuring device used be placed during all fluid level observations?
(PEI/RP 1200-12, Fig. 6-1, 6.2.5)
17. When performing Spill Bucket Integrity testing using the Hydrostatic Test Method, how full should the spill bucket be filled prior to starting the test?
(PEI/RP 1200-12, Section 6.2.5)
18. When performing Spill Bucket Integrity testing using the Hydrostatic Test Method, how far can the fluid level drop after one hour and still be considered a passing test?
(PEI/RP 1200-12, Section 6.2.6)
19. When performing single-walled Spill Bucket Integrity testing using the Vacuum Test Method, what fluid is used?
(PEI/RP 1200-12, Section 6.3.3, 6.3.4)
20. When performing single-walled Spill Bucket Integrity testing using the Vacuum Test Method, the use of gasketing material provides an airtight seal between the spill bucket and what?
(PEI/RP 1200-12, Section 6.3.3)
21. When performing single-walled Spill Bucket Integrity testing using the Vacuum Test Method, how much vacuum is recommended?
(PEI/RP 1200-12, Section 6.3.5)
22. When performing single-walled Spill Bucket Integrity testing using the Vacuum Test Method, how long must the vacuum be applied before taking a vacuum level reading?
(PEI/RP 1200-12, Section 6.3.5)
22. In order for a single-walled Spill Bucket Integrity test using the Vacuum Test Method to pass, the final vacuum reading must be no lower than what value?
(PEI/RP 1200-12, Section 6.3.6)

23. When performing double-walled Spill Bucket Integrity Testing using the Vacuum Test Method, how much vacuum is recommended to be applied to the spill bucket interstitial space?
(PEI/RP 1200-12, Section 6.4.5)
24. When performing double-walled Spill Bucket Integrity Testing using the Vacuum Test Method, how long should the vacuum be applied before taking a vacuum level reading?
(PEI/RP 1200-12, Section 6.4.5)
25. In order for a double-walled Spill Bucket Integrity test using the Vacuum Test Method to pass, the final vacuum reading must be no lower than what value?
(PEI/RP 1200-12, Section 6.4.6)
26. When conducting Containment Sump Integrity testing using hydrostatic test methods, water should be added to the sump until it's a minimum of how far above the highest sump penetration or sump sidewall seam?
(PEI/RP 1200-12, Section 6.5.6)
27. When conducting Containment Sump Integrity testing using hydrostatic test methods, after water has been filled to the appropriate level, how much time should pass before a final water level reading is recorded?
(PEI/RP 1200-12, Section 6.5.6)
28. When conducting Containment Sump Integrity testing using hydrostatic test methods, what's the allowable change in water level that can occur in order for the test to pass?
(PEI/RP 1200-12, Section 6.5.7)
29. The purpose of conducting an automatic shutoff device (flappers or flapper valves) inspection is to determine if product flow will be completely shut off at what tank capacity percent?
(PEI/RP 1200-12, Section 7.1.6 7.1.7)

30. Identify piping and pump configurations that fail inspection when ball float valves are used?
(PEI/RP 1200-12, Section 7.2.7)
31. The purpose of Overfill Alarms is to provide a warning when a tank is how full?
(PEI/RP 1200-12, Section 7.3.2, 7.3.3)
32. To calculate the percent of tank capacity at which an overfill alarm is triggered during testing, the product volume needed to trigger the alarm is divided by __?__ and then multiplied by 100.
(PEI/RP 1200-12, Section 7.3.6)
33. Automatic Tank Gauges (ATG's) are a general industry term that is used to identify all __?__ tank monitoring equipment.
(PEI/RP 1200-12, Section 8.1)
34. On dual-float type ATG's, what's the purpose of the second (lower) float?
(PEI/RP 1200-12, Section 8.2.1.1)
35. When inspecting the ATG probe, how should the float(s) move on the probe stem?
(PEI/RP 1200-12, Section 8.2.1.6)
36. A liquid detecting sensor that is identified as a "discriminating" sensor can detect what types of fluids?
(PEI/RP 1200-12, Section 8.3.1)
37. What is the purpose of performing liquid detecting sensor functionality testing?
(PEI/RP 1200-12, Section 8.3.2)

38. A liquid detection sensor functionality test has been conducted. Results indicate that the sensor triggered an alarm when the alarm condition was simulated. Has this sensor passed testing?
(PEI/RP 1200-12, Section 8.3.7)
39. Automatic line-leak detectors must be able to detect a leak in a product line that is equivalent to how many gallons per hour (line pressure at 10 psig)?
(PEI/RP 1200-12, Section 9.)
40. When conducting a line leak test on either a mechanical line leak detector (MLLD), or on an electronic line leak detector (ELLD), identify testing parameters.
(PEI/RP 1200-12, Section 9.1.5 and 9.2.5)
41. When conducting automatic line leak detector testing on both mechanical and electronic line leak detectors, power must first be turned off to the pump. What procedure should be done to the associated circuit breakers, prior to connecting test apparatus equipment?
(PEI/RP 1200-12, Section 9.1.6, 9.2.6)
42. During a mechanical line leak detector test, line pressure is adjusted to 10 psig and the test apparatus leak orifice is opened. What is the desired leak rate of the test apparatus leak orifice that simulates a leak equivalent to 3 gph at 10 psig?
(PEI/RP 1200-12, Section 9.1.6)
43. Identify testing results on a mechanical line leak detector that indicate a failed test.
(PEI/RP 1200-12, Section 9.1.7)
44. Testing is being done on an electronic line leak detector (ELLD). With a full pump line pressure of 25 psig, what is the volume of product that must be discharged in 60 seconds to be equivalent to a leak rate of 3 gph at 10 psig?
(PEI/RP 1200-12, Section 9.2.6, see Table 9-1)

45. Testing is being done on an electronic line leak detector (ELLD). With a full pump line pressure of 20 psig, what is the volume of product that must be discharged in 15 seconds to be equivalent to a leak rate of 3 gph at 10 psig?
(PEI/RP 1200-12, Section 9.2.6, see Table 9-1)
46. Testing has been completed on an electronic line leak detector (ELLD). During the test, the ELLD did not identify the simulated leak by generating an alarm. Does this test pass?
(PEI/RP 1200-12, Section 9.2.7)
47. Shear valves have other names. What are they?
(PEI/RP 1200-12, Section 10.1)
48. What's the purpose in testing product shear valves?
(PEI/RP 1200-12, Section 10.2.1)
49. Identify observed conditions that results in a product shear valve failing inspection and testing?
(PEI/RP 1200-12, Section 10.2.6)
50. What does the emergency stop switch, also called the emergency shut-off switch, disconnect power to when activated?
(PEI/RP 1200-12, Section 11.1)

API Recommended Practice 1626 “Storing and Handling Ethanol and Gasoline-ethanol Blends at Distribution Terminals and Filling Stations” – Second Edition, August 2010

(American Petroleum Institute)

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. What can higher conductivity rates of gasoline-ethanol blends cause?
(API RP 1626, Section 4.8)

2. E10 consists of three main components. What are they?
(API RP 1626, Section 5.3)

3. What might occur, if anything, when certain sensors, probes, gauges, and other components that are not designed specifically for gasoline-ethanol blends are used in these types of filling station or distribution fueling systems?
(API RP 1626, Section 7.2.1)

4. Filling station fuel system components that come in contact with gasoline-ethanol blends must be compatible in order to assure safe use and regulatory compliance. What are methods that can be used to show a particular component or fueling system is compatible?
(API RP 1626, Section 7.2.2)

5. It is important to check tanks with gasoline-ethanol blended product for water accumulation. Which are factors to consider when determining if water is present in the tank?
(API RP 1626, Section 7.8.2.1)

6. What's the primary cause of "phase separation" occurring in a tank with gasoline-ethanol blended product?
(API RP 1626, Section 7.8.3)

7. Micro-organisms, or microbes, can develop in a tank with gasoline-ethanol blended product where water is present. What are potential harmful results of the presence of these microbes?
(API RP 1626, Section 7.8.4)

8. Ethanol, when compared to gasoline and hydrocarbon fuels, generally has a higher electrical conductivity rate and higher oxygen content, plus more readily absorbs water. Because of these factors, fuel system components that use "soft" metals should not be used, as accelerated corrosion and metal loss may occur. What are examples of a "soft" metal?
(API RP 1626, Section 7.9)

**API Recommended Practice 1632 “Cathodic Protection of
Underground Storage Tanks and Piping Systems” – Third Edition,
May 1996 (Reaffirmed December 2010)**

(American Petroleum Institute)

*(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair
Certification Exam)*

1. The four components of an electrochemical corrosion cell are?
(API 1632, Section 2.1)

2. For buried structures like steel underground tanks, moist soil is which component of an electrochemical corrosion cell?
(API 1632, Section 2.1)

3. Regarding galvanic corrosion, what soil characteristics will affect the type and rate of corrosion occurring on buried structures?
(API 1632 Section 2.2.1.4)

4. When can bimetallic corrosion occur in an underground steel tank?
(API 1632 Section 2.2.2.3)

5. When a cathodic protection system is operating properly, corrosion is ___?
(API 1632 Section 2.3.1)

6. What are advantages of using sacrificial anode cathodic protection systems?
(API 1632, Section 2.3.2.2)

7. What are disadvantages of using sacrificial anode cathodic protection systems?
(API Section 1632, Section 2.3.2.3)

8. Impressed-current anodes are made of relatively ___ materials, such as carbon or graphite.
(API 1632, Section 2.3.3.1)

9. What are advantages of using impressed-current cathodic protection systems?
(API 1632, Section 2.3.3.2)

10. What are disadvantages of using impressed-current cathodic protection systems?
(API 1632 Section 2.3.3.3)

11. When determining which type of cathodic protection system to use, what are factors which should be considered?
(API 1632, Section 2.3.4.2)

12. Zinc anodes used in sacrificial anode protection systems are best utilized in what type of soil conditions?
(API 1632, Section 3.1.1)

13. To calculate requirements for a field-installed sacrificial-anode cathodic protection system, whether a new or existing underground tank, what data is needed?
(API 1632, Section 3.3.2)

14. Magnesium and zinc sacrificial anodes can be prepackaged in chemical backfill. What's the purpose of the chemical backfill?
(API 1632, Section 3.4.2)

15. In new tank installations, sacrificial anodes often placed parallel to the tank walls, at or near the level of the tank bottom. What purpose does this procedure serve?
(API 1632, Section 3.4.3)
16. A common criterion for ensuring adequate sacrificial anode protection of underground petroleum storage tanks and piping is the measurement of a negative potential of at least ? between the tank, or piping, and the surrounding soil (using a copper-copper sulfate reference electrode in contact with the soil electrolyte).
(API 1632, Section 3.6.1)
17. A typical cathodic protection rectifier in an impressed-current cathodic protection system has what major component(s)?
(API 1632, Section 4.2.1)
18. Impressed-current anodes are typically installed in carbonaceous backfill. API 1632 cautions that the ? lead of the rectifier must be attached to the structure to be protected, as rapid corrosion failure of the structure can result if the wrong rectifier lead is connected to the structure.
(API 1632, Section 4.3.4.)
19. API 1632 recommends what type of electrical connection for connecting the negative rectifier lead wire in an impressed-current cathodic protection system to the underground tank?
(API 1632, Section 4.3.5)

API Standard 1631 “Interior Lining and Periodic Inspection of Underground Storage Tanks” – Fifth Edition, June 2001

(American Petroleum Institute)

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. When preparing to open a tank, what are potential sources of ignition which must be assessed?
(API 1631, Section 5.2)

2. Whether using an educator-type or air driven, diffused-air blower method for removal of flammable vapors in a tank, the equipment must be grounded and properly bonded to the tank. Why?
(API 1631, Section 5.5.3.1, 5.5.3.2)

3. When blowing air into a 12-ft. diameter tank to evacuate vapors, what’s the maximum allowable pressure inside the tank?
(API 1631, Section 5.5.3.2, 5.5.4)

4. Where’s the appropriate location(s) inside a tank to take vapor readings to determine the current LEL within the tank?
(API 1631, Section 5.6.3)

5. What must the lower explosive limit (LEL) inside a tank be before it can be safely opened?
(API 1631, Section 5.6.5)

6. Define the term “hot work”.
(API 1631, Section 3.2.24, Referenced throughout Section 6)

7. All personnel entering a tank for cleaning and/or inspection purposes must wear an approved safety harness connected to a safety line that is securely attached where?
(API 1631, Section 6.2.6.2)

8. According to API 1631, a person entering a tank must have an attendant and a standby person. What’s the function of the standby person?
(API 1631, Section 6.2.7)

9. A person is inside the tank performing cleaning activities and the lower explosive limit (LEL) goes above 10%. What should immediately occur?
(API 1631, Section 6.2.9)

10. What information is provided in Material Safety Data Sheets (MSDS) for the product contained in a tank?
(API 1631, Section 3.2.30, referenced in Section 6.3.3et al.)

11. Benzene, a component of gasoline, is a known human carcinogen. Exposure can occur through contact with?
(API 1631, Section 6.3.4.1)

12. When performing an internal tank inspection, the inspector should identify all areas with corrosion that has resulted in metal thickness reduction to ___?
(API 1631, Section 7.3.3.1)

13. Per API 1631, a steel tank may be relined based on perforation numbers and size factors. What are if these factors?
(API 1631, Section 7.3.3.4)

14. When preparing the interior surface of a steel tank for lining using abrasive grit-blasting operations, what conditions must be met?
(API 1631, Section 7.4.2.2)

15. Once the interior tank surface has been prepared for lining, what's the maximum allowable timeframe for lining application?
(API 1631, Section 7.4.2.4)

16. What's the minimum thickness of the lining system applied to the interior surface of a tank?
(API 1631, Section 8.2.4)

17. What's the allowable air pressure range when performing tank lining testing to verify the tank is "tight"?
(API 1631, Section 8.5.3)

18. If an opening was cut into a tank for access, a steel cover plate of approved thickness must be attached. The cover plate must overlap the opening by how many inches?
(API 1631, Section 9.1.2)

19. How often are internal inspections of lined steel tanks with cathodic protection to occur?
(API 1631, Section 10.1.2)

20. API 1631 states that when inspecting a lined tank, the lining must be “significantly free of product, sludge, residue or other materials that would impede visual inspection and at least ___?___ of the lining shall be visible for inspection.
(API 1631, Section 10.3.4)

21. When using video equipment to inspect a tank lining system, the lower explosive limit (LEL) must be monitored, and remain at ___?___ at all times.
(API 1631, Section 10.3.5)

22. After completing the lining inspection, the tank’s metal thickness must be determined. The tank cylinder wall should be divided into ___?___ for metal thickness determination purposes?
(API 1631, Section 10.5.2)

23. After completing metal thickness determinations for a lined steel tank, what must occur if the average metal tank thickness is determined to be between 75% and 85% of the original metal thickness?
(API 1631, Section 10.6.2)

Code of Federal Regulations 40 CFR Part 280 “Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)”

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Program)

1. In 40 CFR 280, the definition of “ancillary equipment” means any devices including, but not limited to, such devices as piping, fittings, flanges, valves, and pumps used to distribute, meter, or control the flow of ? to and from an UST.
(40 CFR Subpart A, 280.12)

2. The definition of a “regulated substance”, according to 40 CFR 280, includes petroleum and petroleum based substances. Identify examples of “regulated substances”?
(40 CFR Subpart A, 280.12)

3. In 40 CFR 280, the definition of “repair” means to ? a tank or UST system component that has caused a release of product from the UST system.
(40 CFR Subpart A, 280.12)

4. In 40 CFR 280, does the definition of “underground storage tank or UST” include underground piping connected to the UST?
(40 CFR Subpart A, 280.12)

5. 40 CFR 280 states that overfill prevention equipment that automatically shuts off flow into the UST must shut the flow off when the tank is no more than ? full.
(40 CFR Subpart B, 280.20)

6. 40 CFR 280 states that all UST's and piping, used to store regulated substances, that is in contact with ? must be properly designed, constructed and protected from corrosion.
(40 CFR Subpart B, 280.20)

7. 40 CFR 280 states that overfill prevention equipment that alerts the transfer operator by restricting the flow into the UST must restrict the flow when the tank is no more than ? full.
(40 CFR Subpart B, 280.20)

8. 40 CFR 280 states all tanks and piping must be properly installed in accordance with the manufacturer's instructions, and in accordance with a code of practice developed by what organizations or entities?
(40 CFR Subpart B, 280.20)

9. According to 40 CFDR 280, all cathodic protection systems must be tested within 6 months of installation. When are additional cathodic protection system tests to be conducted?
(40 CFR Subpart C, 280.31)

10. According to 40 CFR 280, UST systems with impressed current cathodic protection systems must be inspected how often to ensure the equipment is running properly?
(40 CFR Subpart C, 280.31)

11. According to 40 CFR 280 regulations, what must take place when a metal pipe section or associated fitting that has released product as a result of corrosion or other damage has occurred?
(40 CFR Subpart C, 280.33)

12. When a tank and / or piping component has been repaired, 40 CFR 280 states what must occur within 30 days of the repair completion date, unless an approved inspection, monitoring or testing method is used?
(40 CFR Subpart C, 280.33)

13. When a repair of any cathodically protected UST system has been made, 40 CFR 280 regulations state that the cathodic protection system must be tested within what time period?
(40 CFR Subpart C, 280.33)

14. 40 CFR 280 regulations require automatic line leak detectors to be tested how often?
(40 CFR Subpart D, Section 280.44)

15. Automatic line leak detectors, per 40 CFR 280 regulations, must be able to detect leaks of _?_ gallons per hour at 10 psi line pressure within 1 hour.
(40 CFR Subpart D, 280.44)

16. According to 40 CFR 280 regulations, how long must written documentation of all calibration, maintenance, and repair of release detection equipment permanently located on-site be maintained after service work is complete?
(40 CFR Subpart D, 280.45)

17. According to 40 CFR 280, if an UST owner or operator suspects a release has occurred from an UST system, how soon must the WVDEP be notified?
(40 CFR Subpart E, 280.50)

West Virginia Underground Storage Tank Rule “Title 33 Series 30”

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. To whom does the WV Title 33 Series 30 rules apply?
(Section 33-30.3)

2. During what parts of the tank installation process is a “certified person” required to be present?
(Section 33-30.3.2.a.1)

3. In order for an individual to install or upgrade an underground storage tank, that person must have what certification?
(Section 33-30.3.3.a)

4. True or False: A tank worker Class A, B, C, E, or D certification can be awarded to a business or corporation.
(Section 33-30.3.4.a)

5. True or False: An individual certified to do tank work in WV does not need to be a resident of the State.
(Section 33-30. 3.4.b)

6. In order for an applicant to be considered for an Underground Storage Tank worker Class A certification, he or she must be able to demonstrate work experience by participation in regulated underground storage tank system installations, repairs, retrofits, and/or upgrades. What considered applicable work experiences for Class A worker certification?
(Section 33-30.3.4.d; see also 3.2.a.1, 3.2.a.2)

7. How many regulated underground storage tank sites must an applicant for WV Underground Storage Tank Class A certification have worked on as part of applicant requirements?
(Section 33-30.3.4.d)

8. All underground storage tank worker certificates and certificate renewals expire December 31st of every second year. When must applications for certificate renewal and associated payment be submitted in order to renew the certification?
(Section 33-30.3.5)

9. In order for an individual to renew his or her Underground Storage Tank worker certification, how many hours of director approved continuing education training courses must be completed?
(Section 33.30.3.5.a.2)

10. True or False: When any Underground Storage Tank worker class certification application is denied or revoked, the reason or reasons for the denial or revocation must be set forth in writing to the individual by the Director.
(Section 33-30.3.7)

11. True or False: Any person who violates the provisions of the worker certification requirements is subject to enforcement action.
(Section 33-30.3.8)

12. Prior to conducting an underground storage tank installation the tank owner must notify the WVDEP ___ days in advance of the installation.
(Section 33-30.4.3)

**National Leak Prevention Association (NLPA), Standard 631 – Entry,
Cleaning, Interior Inspection, Repair and Lining of Underground
Storage Tanks, January 1997 Edition**

*(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair
Certification Exam)*

1. What procedures applies to Chapter A of NLPA Standard 631?
(see Chapter A Introduction, Page 2)

2. According to NLPA Standard 631, how are perforations in a steel tank measured?
(Section A2.8, page 6)

3. According to NLPA Standard 631, what conditions would render a steel tank
structurally deficient and not suitable for repair?
(Section A10.4.3, page 17)

4. According to NLPA Standard 631, what tests are required upon completion of a lining
applied to a steel tank?
(Section A13, page 19 and 20)

5. What procedures applies to Chapter B of NLPA Standard 631?
(see Chapter B Introduction, page 35)

6. According to NLPA Standard 631, into what size sections must the tank wall be divided
when conducting ultrasonic thickness gauging?
(Section B7.5.1.1, page 37)

7. According to NLPA Standard 631, if the thickness of the tank wall is initially found to be less than ? % of the original wall thickness, additional thickness measurements are required.
(Section B7.5.1.3, page 37)

8. According to NLPA Standard 631, what is required to occur in the event a tank does not pass the average tank metal thickness test of at least 75%?
(Section B8.2, page 38)

9. According to NLPA Standard 631, what must occur in the event a steel tank is found to contain an average tank metal thickness value of between 75% and 85%?
(Section B9.1, page 38)

10. According to NLPA Standard 631, what is the maximum pitting depth allowed for a steel tank to be found suitable for upgrading with cathodic protection without interior lining?
(Section C 13.1.1, no page number)

11. According to NLPA Standard 631, what is the allowable metal tank wall thickness for tanks suitable for cathodic protection without interior lining?
(Section C 13.1.2, no page number)

12. According to NLPA Standard 631, if no manway cover exists in a fiberglass tank, where must an access hole be cut?
(Section D5.3.3, page 65)

13. According to NLPA Standard 631, what test should be conducted to determine whether chemical attack on the tank shell has occurred?
(Section D6.4.3, page 66)

14. According to NLP Standard 631, can tank lining be used to provide compatibility with products other than those that were intended to be stored when the tank was originally manufactured?

Occupational Safety and Health Administration (OSHA), "Safety and Health Regulations for Construction - Excavations", 29 CFR Subpart P, 1926.650 – 652

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. The scope and application of OSHA Section 1926.650 applies to all ? made in the earth's surface, and includes trenches.
(Section 1926.650(a))

2. According to OSHA, ? is a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps.
(Section 1926.650(b))

3. According to OSHA, ? is a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins.
(Section 1926.650(b))

4. According to OSHA, when a tank is installed in an excavation so as to reduce the dimension measured from the tank and the side of the excavation to 15 feet or less, what is the excavation called?
(Section 1926.650(b))

5. Per OSHA guidelines, when must the location of underground installations, like utility lines, be determined in the area where excavating is to occur?
(Section 1926.651(b)(1))

6. Per OSHA guidelines, how deep must an excavation be in order for a means of egress (ladder, ramp, etc.) to be required?
(Section 1926.651(c)(2))

7. According to OSHA, in an excavation requiring a means of egress, the stairway, ladder or ramp is required to be located no more than ___ feet of lateral travel for workers.
(Section 1926.651(c)(2))

8. According to OSHA, in an excavation, an oxygen level of less than ___ requires taking precautions like proper respiratory protection or ventilation.
(Section 1926.651(g)(1)(ii))

9. According to OSHA rules, employees should not be exposed to atmospheres where the concentration of a flammable gas is greater than what percent of the lower flammable limit of that gas?
(Section 1926.651(g)(1)(iii))

10. Per OSHA guidelines, what emergency rescue equipment should be present whenever hazardous atmospheric conditions exist, or may reasonably be expected to develop, during work in an excavation?
(Section 1926.651(g)(2)(i))

11. According to OSHA, what precautions might need to be taken to protect employees in excavations with water accumulations?
(Section 1926.651(h)(1))

12. Per OSHA guidelines, what's the minimum distance allowed for placement of excavated materials and/or equipment from an excavation?
(Section 1926.651(j)(2))

13. According to OSHA, each employee in an excavation shall be protected from cave-ins by an adequate protective system except under what conditions?
(Section 1926.652(a)(1), (a)(1)(i) and (a)(1)(ii))

14. Per OSHA guidelines, excavation walls must be sloped at an angle not steeper than ? degrees?
(Section 1926.652(b)(1)(i))

National Fire Protection Association – NFPA 30 -Flammable and Combustible Liquids Code and NFPA 30A – Code for Motor Fuel Dispensing Facilities and Repair Garages (NFPA 30, Chapter 23 - Storage of Liquids in Tanks – Underground Tanks, NFPA 30A – Chapter 5 – Piping for Liquids, Chapter 6 – Fuel Dispensing Systems, and NFPA 30A – Chapter 8 – Electrical Installations) – 2012 Edition

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. According to NFPA 30, tank manufacturers specify the maximum burial depth of a tank. When consulting with the tank manufacturer on locating a tank deeper than its specified maximum burial depth, what is one important factor that the manufacturer needs to know?
(NFPA 30, Chapter 23.5.3.2)

2. Tank venting systems are designed to prevent backflow of vapor or liquids at the fill opening while the tank is being filled. According to NFPA 30, what is the nominal vent line diameter, in inches, allowed for a maximum flow of 300 gallons per minute (gpm) with a vent piping length of 100 feet?
(NFPA 30, Chapter 23.6.2)

3. Per NFPA 30 guidelines, all UST's with a capacity of more than __?__ gallons must be equipped with a tight fill device for connecting the fill hose to the tank.
(NFPA 30, Chapter 23.13.5)

4. When locating a UST in a area subject to flooding and/or high groundwater, NFPA 30 states that the anchoring or securing method used must be based on the buoyance of a (an) __?__ tank that is fully submerged.
(NFPA 30, Chapter 23.14.1 and 23.14.1.1)

5. According to NFPA 30A, flexible piping connections must be provided at what locations within the piping system?
(NFPA 30A, Chapter 5.3.2.1)

6. According to NFPA 30A, vent piping connected to underground tanks storing Class I liquids should extend how far above ground?
(NFPA 30A, Chapter 5.6.2)

7. According to NFPA 30A, when tank vent piping is installed within or attached to a canopy, the vent pipes must be terminated at what height?
(NFPA 30A, Chapter 5.6.3)

8. According to NFPA 30A, fuel dispensing hoses at automotive fuel dispensing facilities are not to exceed what length?
(NFPA 30A, Chapter 6.5.1)

9. According to NFPA 30A, where should emergency shut off switches be positioned?
(NFPA 30A, Chapter 6.7)

West Virginia Department of Environmental Protection “Secondary Containment Guidance Document” – Updated 2/5/2010

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. True or False: Since July 1, 2008, all new underground tanks must meet requirements for secondary containment.

2. True or False: Since July 1, 2008, all new underground piping associated with underground storage tanks must meet requirements for secondary containment.

3. According to the WVDEP’s Secondary Containment Guidance Document, what’s the definition of “replaced piping”?

4. Per WVDEP’s Secondary Containment Guidance Document pertaining to replaced piping, secondary containment requirements are required any time a minimum of ? feet, or 50% of the total length of piping, whichever is less, connected to a single underground tank is replaced.

5. When calculating the total length of piping connected to one underground storage tank with multiple dispensers, what distance must be used?

6. True or False: When secondary containment is required due to piping replacement at a location with multiple tanks, all tanks and associated piping must have secondary containment systems installed, regardless of which tank's associated piping was replaced.

7. True or False: Secondary containment installed after July 1, 2008 must be designed, constructed, and installed to be checked for evidence of a release at least every 30 days.

8. In order for systems installed after July 1, 2008 to meet the required criteria of secondary containment systems, testing of system sumps and interstices is required at installation and every ? years thereafter.

9. All new or replaced motor fuel dispenser systems must now have under-dispenser containment. If only a dispenser, shear valve, or dispenser and shear valve are replaced, and no additional connected dispenser system components are replaced, is the use of a secondary containment system required?

40 CFR Part 63 Subpart CCCCCC “National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities”

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. What must Gasoline dispensing facilities with a monthly gasoline throughput greater than 100,000 gallons do to comply with 40 CFR Part 63 Subpart CCCCCC?
(40 CFR Part 63.11117)

2. Submerged fill pipes installed after November 9th, 2006 on gasoline dispensing facilities with a monthly throughput of 10,000 gallons or more must be located where within the tank?
(40 CFR Part 63.11117)

Steel Tank Institute “STIP3 Cathodically Protected Underground Storage Tanks” - Publication R821 (June 2010)

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. What is the required bedding thickness when installing a STIP3 tank without a concrete anchor pad?
 (Section 1.1)

2. What is the required bedding thickness when installing a STIP3 tank using a concrete anchor pad?
 (Section 1.2)

3. Identify acceptable backfill materials when installing a STIP3 tank.
 (Section 1.3)

4. When installing permanent metal plugs into unused openings in a STIP3 tank installation, where should the pipe sealant be applied?
 (Section 2.1)

5. What method should never be used to lift or lower a STIP3 tank?
 (Section 4.3)

6. STIP3 tanks may be equipped with either zinc or magnesium anodes. Magnesium anodes are designed only for installation in soil resistivities of 2,000 ohms-cm or greater. What soil resistivities are zinc anodes designed for?
(Section 5.1)

7. When installing a STIP3 tank, what must be performed at the time of backfilling to ensure the immediate operation of the cathodic protection system?
(Section 5.3)

8. Which hold-down straps are prohibited for use on a STIP3 tank?
(Section 6.2)

9. What area of the tank backfill is especially important in supporting a STIP3 tank?
(Section 7.2)

10. Prior to backfilling the top of a STIP3 tank, what should be done to ensure all nylon bushings are in place?
(Section 7.3)

11. How much torque **may be** required to fully insert pipe fittings threaded into the nylon bushings that are in all the STIP3 tank top openings?
(Section 8.1)

12. When installing a STIP3 tanks with a PP4 monitoring system, when should the plastic outer bag on the reference cell element of a PP4 monitoring station be removed?
(Section 9.3)

13. Where in the excavation would the reference cell element of the PP4 monitoring station be placed on a STIP3 tank?
(Section 9.3)

14. When using Protection Prover 2® (PP2) Cathodic Protection Monitoring Station on a STIP3 tank, how much backfill material should be used to cover the terminal?
(Section 9.8.4)

15. When using a Protection Prover 1® (PP1)Monitoring System on a STIP3 tank, what must be installed at grade to allow access to the system?
(Section 9.9)

16. What is a simple test that can be done after all piping and fittings have been installed on a STIP3 tank, but before backfilling, to be sure that there is electrical isolation between metal fittings and the tank?
(Section 10.1)

17. When installing a STIP3 tank, the first cathodic protection monitoring reading should be taken prior to placement of a concrete or asphalt pad on top of the tank. To indicate the tank anodes are activated what should the minimum reading be?
(Section 12.1)

18. STIP3 tanks must be installed within how many days of delivery date from the manufacturer?
(Section 14.3)

19. Who should sign the Steel Tank Institute's Tank Installation checklist?
(Installation checklist form)

Steel Tank Institute “FRP Composite Steel Underground Storage Tanks” – Publication R913 (June 2010)

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. When visually inspecting a fiberglass coated steel (ACT-100) tank for damage, what areas should be noted for possible repair?
(Section 3.2)

2. When visually inspecting a fiberglass coated steel (ACT-100) tank for damage prior to installation, all “holidays”, damaged surface laminate, and/or exposed steel surfaces must be re-coated using the furnished touch-up kit. After the problem area is re-coated, what’s the next step the installer must perform?
(Section 3.2, 3.3)

3. When checking to be sure that connected piping and fittings are electrically isolated from a fiberglass coated steel (ACT-100) tank, where can electrical contact with the tank shell be made?
(Section 8.1.1)

4. During the installation of an ACT-100 fiberglass coated steel tank the coating can become chipped and the steel of the tank can become exposed. Where does this most often occur?
(Section 9.2)

Steel Tank Institute “FRP Jacketed Steel Underground Storage Tanks”, Publication R923-10 (June 2010)

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. What is the minimum vacuum within the interstice of a double walled Permatank when it is shipped from the factory?
(Section 2.2)

2. When should the factory installed vacuum gauge of a double walled Permatank be read for the first time by the installer?
(Section 2.3)

3. When, during the installation process of a double walled Permatank, the tank must be temporarily stored above ground and high wind conditions are expected, how should the tank be secured?
(Section 3.6)

4. When anchoring a double walled Permatank, identify allowable hold-down straps.
(Section 5.1 and 5.2)

5. A double walled Permatank tank is 30 feet long and 8 feet in diameter. The hold-down straps at the ends of the tank must be no more than ? feet from the end of the tank.
(use formula from Section 5.3)

6. When installing a double walled Permatank, where should the first 2 feet of backfill be placed?
(Section 6.3 and 6.4)

7. When installing a double walled Permatank, the use of light hand-operated compaction equipment is recommended for all sand backfills to at least ? feet above the tank.
(Section 6.4)

8. What does the Precision Test System (PTS) of a double walled Permatank monitor?
(See PTS installation instructions)

9. When conducting a post-installation Precision Test, using the Precision Test System (PTS) of a double walled Permatank, what is the minimum vacuum required before a test can begin?
(See PTS installation instructions)

10. When conducting a post-installation Precision Test, using the vacuum gauge on a double walled Permatank, how long is the test period for a 12,000 gallon tank?
(PTS installation instructions)

11. In order to pass a post installation Precision Test, using the vacuum gauge on a double walled Permatank, the change in vacuum within the interstice must be less than ? inches Hg.
(see PTS installation instructions)

Containment Solutions Fiberglass Storage Tanks “Installation Instructions”

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. When lifting and unloading a Containment Solutions fiberglass storage tank, identify what cautions are to be considered.
(Section A, Handling and Preparation)

2. Containment Solutions fiberglass storage tank installation guidance warns not to pressurize their tanks above certain levels. What's the maximum pressure recommended for an 8-foot diameter Containment Solutions fiberglass storage tank?
(Section C, Pre-Installation Testing)

3. According to Containment Solutions fiberglass storage tank installation guidance, the wet annular space of a double walled tank should be pressurized to what level for pre-installation testing?
(Section D7, D8, D9)

4. A Containment Solutions fiberglass storage tank, with a diameter of 6 feet, must have a minimum burial depth of ? in locations with traffic loads.
(Section G, Burial Depth and Cover, see Figure G-3)

5. When installing an 8-foot diameter Containment Solutions fiberglass storage tank, what maximum working load, in pounds (lbs), should the tank strap and all hardware be designed for?
(Section H, Anchoring, see Table H-2)

6. When installing a Containment Solutions Fiberglass storage tank, tank vertical deflection measurements must be taken. Between what two points is the measurement made?
(Section I, Tank Installation, see Figure I-2)

7. What tools should be used when taking vertical tank diameter measurements on a Containment Solutions Fiberglass storage tank?
(Section I, Tank Installation)

8. Through which tank opening on a Containment Solutions Fiberglass Storage tank should the tank diameter measurements be made for calculating tank deflection during installation?
(Section I, Tank Installation)

9. When is the "First Vertical Tank Diameter Measurement" taken on a Containment Solutions Fiberglass storage tank for recording on the Tank Installation Checklist?
(Section I, Tank Installation)

10. What is the maximum allowable tank diameter deflection value for an 8-foot Containment Solutions fiberglass storage tank?
(Section I, Tank Installation, Table I-1)

11. In the event the maximum tank diameter deflection value has been exceeded on a Containment Solutions Fiberglass storage tank at any time, what should immediately occur?
(Section I, Tank Installation)

12. Collar joints of Containment Solution fiberglass tank top sumps must be tested to ensure the joint is liquid tight before backfilling around the collar. How long after the first liquid level measurement is the second measurement taken?
(Section P, Containment Collars, Tank Sumps and Tank Risers)

Xerxes – Installation Manual and Operating Guidelines For Fiberglass Underground Storage Tanks

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. When installing a Xerxes fiberglass underground storage tank, what should be done if damage to the tank is discovered during pre-installation inspection or testing?
(Section 3.2)

2. When installing a Xerxes fiberglass underground storage tank and conducting pressure testing, what's the maximum pressure that can be used for a "wet interstitial space"?
(Section 3.3)

3. When conducting an air pressure test on the inner wall of a Xerxes double-wall tank with a dry interstitial space, at what pressure should the test be conducted?
(Section 3.4.1 and Figure 3.1)

4. When conducting an air pressure test on the inner wall of a Xerxes double-wall tank with a dry interstitial space, at what pressure should the pressure relief valve be set for a 12-foot diameter tank?
(Section 3.4.1)

5. When air testing a dry-monitor, double wall Xerxes tank, what areas of the tank are to be "soaped" after the primary tank has been pressurized?
(Section 4.4)

6. When air testing a dry-monitor, double-wall multi-compartment Xerxes tank not under vacuum, what is the minimum time the pressure should be monitored?
(Section 4.5.5)

7. During installation, does Xerxes require their tanks to be sloped?
(Section 5.2.12.3)

8. What is the effect on the tank warranty when using backfill material that has not been approved by Xerxes?
(Section 6.1.3)

9. If backfill material is not available that meets Xerxes standards, what should be done?
(Section 6.2.3)

10. For Xerxes tanks used for petroleum storage located in an area **not** subject to traffic, what are allowable minimum depths of cover thickness?
(Table 7.2)

11. For Xerxes tanks used for petroleum storage located in an area with traffic, which of the following are allowable minimum depths of cover thickness?
(Table 7.2)

12. What is the minimum distance required between the bottom of an unattached manway riser and the top of a Xerxes fiberglass underground storage tank?
(Section 7.4.10)

13. Xerxes require what minimum spacing distance between tanks (assuming deadmen are not used)?
(Section 7.5.2.2, Figure 7-3)

14. When using Xerxes D-ring/hook anchor or D-ring/D-ring anchor straps with Xerxes prefabricated deadmen, what's the depth of the deadmen in relation to the tank?
(Section 8.2.2.1, 8.2.3.1, Figure 8-1)

15. When Xerxes-supplied anchoring hardware is not being used for anchor straps, what is the minimum wire-rope diameter required for an 8-foot diameter tank?
(Section 8.3.2, Table 8-3)

16. Prior to installing a Xerxes fiberglass underground storage tank, a tank diameter measurement must be taken as a starting point to measure tank deflection during installation. At what point during the installation process are additional tank measurements required?
(Section 11.1.4)

17. For a 12-foot diameter Xerxes tank equipped with access openings, what is the distance between the inside bottom of the tank and the top of the access opening (used for determining correct internal piping sizing)?
(Section 14.1.3, use Figure 14-2 and Table 14-2)

18. In a Xerxes double-wall tank, the primary tank is designed to operate at what pressure?
(Section 14.3.2)

19. Once a Xerxes double walled tank with a wet interstitial space is installed, what factors may cause fluctuation in the level of the monitoring fluid?
(Section 15.3.4.2)

20. Xerxes does not recommend pump or pressure filling of their tanks. Why?
(Section 18.5)

21. After a Xerxes tank(s) has been installed, to whom must the tank installer give the Installation Manual and the completed Tank Installation Checklist?
(Section 21.1)

**Fiber Glass Systems – Red Thread IIA Piping System “General Installation Instructions”, Manual No. B2160 (October 1, 2008)
(formerly Smith Fiberglass Products, now Smith FiberCast)**

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. Fiber Glass Systems pipe installation manual cautions exposing machined fiberglass piping surfaces to direct sunlight. Why?
(Layout and Preparation, page 2)

2. Fiber Glass Systems pipe installation manual indicates what methods are appropriate for cutting fiberglass pipe?
(Tools Section, page 3)

3. Fiber Glass Systems pipe installation manual indicates what materials are approved for use as backfill for fiberglass piping?
(Trenching and Backfilling, page 5)

4. Fiber Glass Systems pipe installation manual states what substances are **not** approved to clean a fiberglass pipe joint?
(Joint Prep, page 6)

5. When fitting 3-inch or 4-inch diameter Red Thread fiberglass pipe together a driving force must be used. A rubber mallet or dead blow hammer may be used when striking a bell end. What must be used on the spigot end?
(Joint Assembly, page 8)

6. Fiber Glass Systems guidance manual for piping installations indicates strap wrenches should be placed how far away from the pipe joint during threaded and bonded (T.A.B) piping installation procedures?
(Joint Assembly, page 9)

7. Fiber Glass Systems guidance manual for piping installations indicates how much movement should be seen in the joint when checking joint "lock-up" by moving the free pipe end (up-and-down or side-to-side motion)?
(Joint Assembly, page 9)

8. According to Fiber Glass Systems pipe installation manual, what's the ambient cure time for Adhesive Type 7000 when the temperature is 60 degrees F?
(Joint Cure – Table 7, page 9)

9. Fiber Glass Systems pipe installation manual indicates, when connecting Red Thread pipe to other systems by bolting a flange to the pipe, what factors must be considered?
(Connecting to Other Systems, page 11)

10. Fiber Glass Systems, Red, Thread pipe installation instructions declares that testing with air or gas is extremely dangerous and should not be done, however if pressure testing is required, how long should the initial pressure test be held, at a minimum, before soaping all joints to check for leaks?
(Testing Recommendations, page 13)

11. Fiber Glass Systems, Red, Thread pipe installation instructions declares that testing with air or gas is extremely dangerous and should not be done, however if pressure testing is required, what is the recommended line pressure for conducting the second testing cycle?
(Testing Recommendations, page 13)

12. Fiber Glass Systems, Red, Thread pipe installation instructions declares that testing with air or gas is extremely dangerous and should not be done, however if pressure testing is performed, and after the piping has passed testing using gas or air, what is the recommended pressure to be placed on the line until all paving/surface work has been completed?
(Testing Recommendations, page 13)

13. If a section of Fiber Glass Systems 2-inch fiberglass pipe is damaged over an area less than 2 inches in diameter, how long should the repair "patch" be?
(Repair Procedures, page 14)

14. If a section of Fiber Glass Systems 2-inch fiberglass pipe is damaged over an area greater than 2 inches in diameter, what are potential repair options, based on the extent of damage?
(Repair Procedures, page 14)

15. Fiber Glass Systems installation instructions states what must be done to any adhesive-bonded joint that is found to leak during pressure testing?
(Repair Procedures, page 15)

16. Fiber Glass Systems manual for pipe installation indicates, when installing a clam shell containment crossover, ? is the minimum distance allowed, measured from pipe center to pipe center, between two containment fittings 3 inches in diameter.
(Secondary Containment, Containment Crossover Detail, page 18)

17. For secondary containment systems for gasoline alcohol blends, what adhesive does Fiber Glass System Smith Fibercast require?
(Secondary Containment, Adhesives, page 21)

Ameron International Dualoy 3000/L Installation “Installation Practices for Secondary Containment Piping Systems”, Bulletin 8702, FP264J (11/07)

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. According to Ameron Dualoy Installation Practices for secondary containment piping systems, what should be done in the event containment piping is received with factory tapered ends?
(page 6)

2. According to Ameron Dualoy Installation Practices for secondary containment piping systems, how far into the secondary containment fittings should the secondary pipe be inserted?
(page 6)

3. When installing Ameron Dualoy secondary containment piping, what is the minimum cure time for Ameron PSX-20 amine-cured epoxy resin when the ambient temperature is 65 degrees F (Fahrenheit)?
(page 8)

4. According to Ameron Dualoy Installation Practices for secondary containment piping systems, what is the sole purpose of bolts used when assembling secondary containment fitting halves?
(page 8)

5. According to Ameron Dualoy Installation Practices for secondary containment piping systems, when containment fittings are being joined with bolts, bolts are to be tightened by alternating from one side of the fitting to the other. What does this ensure?
(page 8)

6. According to Ameron Dualoy Installation Practices for secondary containment piping systems, when containment fittings are being joined with bolts, which bolts should be tightened first on tees and elbows?
(Page 8)

7. What size hole is required to be cut in the sump wall for installation of the Ameron Dualoy sump fitting?
(Page 9)

8. According to Ameron Dualoy Installation Practices for secondary containment piping systems, when repairing a 2-inch primary pipe secondarily contained within a 3-inch containment pipe, the 2-inch repair coupling is placed inside a __?__ inch containment nipple?
(Page 11)

OPW Fueling Containment Systems “Flexible Underground Piping Manual”, Publication Number UPM-0001 (04/28/11)

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. The OPW Fueling Containment Systems piping manual describes three different piping routing systems. The system used for pressure piping where two piping lines interconnect all the dispensers divided equally is called ___?
(Section 6.0 – 6.3, page 6)

2. The OPW Fueling Containment Systems piping manual indicates piping trenches should be cut with sweeping turns. What’s the minimum radius allowed for a 2 inch OPW pipe?
(Section 7.1, page 7)

3. The OPW Fueling Containment Systems piping manual indicates the minimum pipe separation distance for OPW piping within a trench is ___?
(Section 8.1, page 7)

4. The OPW Fueling Containment Systems piping manual states the minimum thickness of approved bedding material to be placed at the bottom of the OPW piping trench is how much?
(Section 8.2-see NOTE after 8.2.3, page 7)

5. The OPW Fueling Containment Systems piping manual states the minimum thickness allowable between the top of the Access Pipe and the top of a paved or unpaved surface is how much?
(Section 8.5.3, page 8)

6. What are pipe coupling options available for use with OPW Fueling Containment Systems flexible piping?
(Section 9.1, page 8)

7. When installing an OPW Fueling Containment Systems Flexworks Access Pipe between two sumps, a measure first must be taken between the first and second sump wall that have had Access Pipe entry boots installed. How much longer than this measurement must the Access Pipe be cut?
(Section 10.1, page 8-9)

8. For single pipe, dual pipe and suction supply system pump connections, OPW Fueling Containment Systems flexible piping manual warns that a plumbing wrench should never be applied to which section of the connections?
(Section 11.1.1, 11.1.2, 11.2.1)

9. Can OPW Fueling Containment Systems flexible piping be installed when the ambient temperature is below 40 degrees F?
(Section 13.2, page 11)

10. When cutting OPW Fueling Containment Systems flexible pipe, what's necessary for proper installation of the OPW pipe couplings?
(Section 13.4, page 11)

11. What type of lubricant is **not** allowed for use when assembling OPW Fueling Containment Systems tapered swage onto the threaded shaft of the swivel pipe coupling?
(Section 13.6.2, 13.6.3, page 12)

12. OPW's Fueling Containment Systems Vent flexible piping comes in both 2 inch and 3 inch size. What can this type of piping be used for?
(Section 17.0, page 16)

13. When conducting air pressure or hydrostatic testing for OPW Fueling Containment Systems flexible supply piping, what is the maximum pressure allowable?
(Section 18.3 and 18.4, page 17)

14. When performing air pressure testing to ensure secondary containment integrity, OPW Fueling Containment Systems flexible piping manual recommends no more that ? psi of pressure be applied to the piping interstitial space.
(Section 20.3, page 18)

Franklin Fueling Systems “UPP Piping Installation Guide Overview”

(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair Certification Exam)

1. Franklin Fueling Systems UPP Underground Fuel Pipe construction consists of 3 layers. What is the outer layer constructed of?
(Underground fuel Pipe construction, page 3)

2. What should be used when lifting Franklin Fueling Systems UPP pipe crates by crane?
(Transit, On-loading and Storage, page 4)

3. It is recommended that Frankling Fueling Systems UPP pipe be allowed to “rest” in its uncoiled state for how long before use (assume normal ambient temperature)?
(Uncoiling Pipe, page 4)

4. What’s the recommended minimum burial depth of Franklin Fueling Systems UPP pipe?
(Pipe Burial Guidelines, page 5)

5. What’s the recommended minimum slope for Franklin Fueling Systems UPP piping vapor return lines back towards the tank?
(Pipe Burial Guidelines, page 5)

6. When mechanical joints or compression fittings are used in a Franklin Fueling Systems UPP piping run, where must they be located?
(Pipe Burial Guidelines, page 5)

7. Franklin Fueling Systems UPP pipe exceeding ? feet should be laid in a series of large snake-like curves and not in straight lines.
(Pipe Burial Guidelines, page 6)

8. For a Franklin Fueling Systems UPP 2-inch diameter double wall pipe, what's the allowable pipe bend radius with an ambient temperature of 70 degrees F?
(Pipe Burial Guidelines, Table 1, page 6)

9. Franklin Fueling Systems UPP pipe detector tape should be installed directly above the pipe run, and at what recommended depth below grade?
(Pipe Detector Tape, page 7)

10. What is a suitable high pressure testing method for use with Franklin Fueling Systems UPP pipe systems?
(Pressure Testing, page 7)

11. Using Franklin Fueling Systems UPP's recommended hydrostatic pressure testing method, what pressure is used for the testing phase?
(Pressure Testing, page 8)

12. Using Franklin Fueling Systems UPP's recommended hydrostatic pressure testing method, how many pressure readings should be taken during the 90-minute test period?
(Pressure Testing, page 8)

13. Using Franklin Fueling Systems UPP's recommended pneumatic tightness testing method, what pressure is used for piping and fittings over 2 inch diameter?
(Pressure Testing, page 9)

14. Using Franklin Fueling Systems UPP recommended pneumatic tightness testing method on a 2 inch pipe, the tightness test passes if what minimum pressure is recorded throughout the test; assuming the temperature variation during the test was less than 10 degrees F?
(Pressure Testing, Table 3, page 9)

**Franklin Fueling Systems “XP Installation Guide Overview”, Manual #
771-232-00, Revision 7 (March 2012) - (Includes APT piping brand)**

*(Study Guide Questions for West Virginia Underground Storage Tank Installation and Repair
Certification Exam)*

1. Franklin Fueling Systems XP series direct bury XP-100-SC piping has a primary pipe pressure rating of 100 psi, and a secondary pipe rating of ___?
(XP Piping Information Table, page 2)

2. Franklin Fueling Systems XP Installation Guide recommends the “scuff guard layer” on APT Secondary Contained pipe not be exposed to direct sunlight for longer than ___
as UV degradation may occur.
(Preparation & Materials, Storing Materials, page 3)

3. Franklin Fueling Systems XP Installation Guide cautions, when temperatures are below ___ degrees F, to avoid pipe kinking or impacting, as this may create damage to the primary and/or secondary layer.
(Preparation & Materials, Installation Temperature Range, page 3)

4. When installing Franklin Fueling Systems APT flexible piping, a minimum of ___ inches is required between the outside of a piping run and the trench wall.
(Preparation & Materials, Trenches, page 3)

5. When backfilling around Franklin Fueling Systems XP (APT) flexible piping, a minimum of ? inches of backfill is required under and between piping runs.
(Preparation & Materials, Backfill Materials, page 4)

6. Franklin Fueling Systems APT transition sumps are all designed to be “cut down” in ? inch increments to adjust to different burial depths and layouts.
(Installation, Sump Cutdown, page 4)

7. When installing Franklin Fueling Systems APT transition sumps, what is the minimum clearance required between the bottom of the manhole lid and the top of sump lid?
(Installation, Sump Lids/Manholes, page 4)

8. When dispensing Franklin Fueling APT from a reel, Franklin Fueling cautions that the pipe should always be pulled from the bottom of the reel to avoid pipe kinking. If kinking occurs, what should be done with that section of pipe?
(Installation, Pipe Pulling, page 5)

9. To ensure a good entry boot seal the scuff guard on Franklin Fueling System XP double wall pipe must be cut back how far?
(Installation, Pipe Cutback, page 5)

10. When conducting an installation pressure test on Franklin Fueling XP primary piping, what is the pressure range that should be applied to the piping?
(Installation Testing, Primary Minimum/Maximum Test Pressure, page 6)

11. When conducting an installation pressure test on Franklin Fueling XP secondary piping, after test boots have been properly installed, what is the pressure range that should be applied to the piping?
(Installation Testing, Secondary Piping Test Pressure, page 6)

12. True or False: All Franklin Fueling Systems APT products must be installed by APT factory certified installers.
(Certification, page 9)