

**Registration form**

**Confined Space CEU Training Course \$200.00**

Continuing Education Course Only, this course does not include a hands-on or actual training.  
**48 HOUR RUSH ORDER PROCESSING FEE ADDITIONAL \$50.00**

**Start and finish dates:** \_\_\_\_\_

*You will have 90 days from this date in order to complete this course*

List hours worked on assignment, must match State Requirement. \_\_\_\_\_ Either 20 or 12 hours.

**Name** \_\_\_\_\_ **Signature** \_\_\_\_\_

*I have read and understood the disclaimer notice on page 2. Digitally sign XXX*

**Address:** \_\_\_\_\_

**City** \_\_\_\_\_ **State** \_\_\_\_\_ **Zip** \_\_\_\_\_

**Email** \_\_\_\_\_ **Fax** (\_\_\_\_\_) \_\_\_\_\_

**Phone:**  
**Home** (\_\_\_\_\_) \_\_\_\_\_ **Work** (\_\_\_\_\_) \_\_\_\_\_

**Operator ID #** \_\_\_\_\_ **Exp. Date** \_\_\_\_\_

**Additional certificate for another Agency – additional fee \$25**

**Please circle/check which certification you are applying the course CEU's.**

Water Treatment\_\_\_ Distribution \_\_\_ Collection\_\_\_ Wastewater Treatment \_\_\_

BPAT\_\_\_ Irrigation \_\_\_ CSI\_\_\_ Onsite Installer\_\_\_ Other \_\_\_\_\_

Oregon CCB (\$50 additional fee) \_\_\_\_\_

*Your certificate will be emailed to you in about two weeks unless you pay for the rush service.*

Technical Learning College PO Box 3060, Chino Valley, AZ 86323  
Toll Free (866) 557-1746 Fax (928) 272-0747 info@tlch2o.com

**If you've paid on the Internet, please write your Customer#** \_\_\_\_\_

**Please invoice me, my PO#** \_\_\_\_\_

**Please pay with your credit card on our website under Bookstore or Buy Now. Or call us and provide your credit card information.**

## **DISCLAIMER NOTICE**

I understand that it is my responsibility to ensure that this CEU course is either approved or accepted in my State for CEU credit. I understand State laws and rules change on a frequent basis and I believe this course is currently accepted in my State for CEU or contact hour credit, if it is not, I will not hold Technical Learning College responsible. I fully understand that this type of study program deals with dangerous, changing conditions and various laws and that I will not hold Technical Learning College, Technical Learning Consultants, Inc. (TLC) liable in any fashion for any errors, omissions, advice, suggestions or neglect contained in this CEU education training course or for any violation or injury, death, neglect, damage or loss of your license or certification caused in any fashion by this CEU education training or course material suggestion or error or my lack of submitting paperwork. It is my responsibility to call or contact TLC if I need help or assistance and double-check to ensure my registration page and assignment has been received and graded. It is my responsibility to ensure all information is correct and to abide with all rules and regulations.

*You can obtain a printed version of the course from TLC for an additional \$69.95 plus shipping charges.*

## **Disclaimer**

*This course is not good for confined space or Competent person certification; this course is only for continuing education purposes. You need a hands-on course for confined space certification. Confined space work/Trenching is very dangerous and this course is not a substitute for classroom training, it is for professional development only.*

## **Grading Information**

In order to maintain the integrity of our courses we do not distribute test scores, percentages or questions missed. Our exams are based upon pass/fail criteria with the benchmark for successful completion set at 70%. Once you pass the exam, your record will reflect a successful completion and a certificate will be issued to you.

**Please fax or e-mail the answer key to TLC [info@tlch2o.com](mailto:info@tlch2o.com)  
Western Campus Fax (928) 272-0747.**

Always call to confirm we've received your work. ***We need a copy of your driver's license to confirm it is you.***

## **AFFIDAVIT OF EXAM COMPLETION**

I affirm that I personally completed the entire text of the course. I also affirm that I completed the exam without assistance from any outside source. I understand that it is my responsibility to file or maintain my certificate of completion as required by the state or by the designation organization.

## **TCEQ... Attention Texas Operators, CSI, Irrigators and Backflow Testers...**

NOTE: Any course cannot be taken for same credit in the same renewal period. Please call TCEQ and make sure that these courses are still accepted for credit before starting. Do not retake this course for credit in the same renewal period.

**A second certificate of completion for a second state agency \$50 processing fee.**

**Many States and employers require the final exam to be proctored.**

**All downloads are electronically tracked and monitored for security purposes.**

# For Texas TCEQ Wastewater Licensed Operators Important Information

## Wastewater/Collections Rule Changes

### Rule Changes and Updates for Domestic Wastewater Systems

On Nov. 4, 2014, TCEQ commissioners adopted revisions to 30 Texas Administrative Code (TAC), Chapter 217, Design Criteria for Domestic Wastewater Systems, and “re-adopted” previously repealed rules in 30 TAC, Chapter 317, Design Criteria Prior to 2008.

#### ***Some of the changes to Chapter 217 include:***

- Adding new definitions and clarifying existing definitions;
- Adding design criteria and approval requirements for rehabilitation of existing infrastructure;
- Adding design criteria for new technologies, including cloth filters and air lift pumps;
- Making changes to reflect modern practices, standards and trends;
- Modifying rule language to improve readability and enforceability; and
- Modifying the design organic loadings and flows for a new wastewater treatment facility.

### **SUBCHAPTER A: ADMINISTRATIVE REQUIREMENTS §§217.1 - 217.18**

Effective December 4, 2015 §217.1. Applicability. (a) Applicability. (1) This chapter applies to the design, operation, and maintenance of: (A) domestic wastewater treatment facilities that are constructed with plans and specifications received and approved by the executive director after the effective date of the amendments to this chapter; (B) treatment units that are altered, constructed, or re-rated with plans and specifications received and approved by the executive director after the effective date of the amendments to this chapter; (C) collection systems that are constructed with plans and specifications received and approved by the executive director after the effective date of the amendments to this chapter; (D) collection system units that are altered, constructed, or re-rated with plans and specifications received and approved by the executive director after the effective date of the amendments to this chapter; (E) existing domestic wastewater treatment facilities that do not have a current Texas Pollutant Discharge Elimination System permit or a Texas Land Application Permit and are required to have an active wastewater permit; (F) existing wastewater treatment facilities and collection systems that never received approval for plans and specifications from the executive director; and (G) collection system rehabilitation projects covered in §217.56(c) and §217.69 of this title (relating to Trenchless Pipe Installation; and Maintenance, Inspection, and Rehabilitation of the Collection System). (2) Domestic wastewater treatment facilities, treatment units, collection systems, and collection system units with plans and specifications approved by the executive director that were received on or after August 28, 2008 and before the effective date of this chapter must comply with the rules in this chapter, as they existed immediately before the effective date of the amendments to this chapter.

The rules in Texas Commission on Environmental Quality Page 2 Chapter 217 - Design Criteria for Domestic Wastewater Systems effect immediately before the effective date of the amendments to this chapter are continued in effect for that purpose. (3) This chapter does not apply to: (A) the design, installation, operation, or maintenance of domestic wastewater treatment facilities, treatment units, collection systems, or collection system units with plans and specifications that were approved by the executive director on or before August 27, 2008, which are governed by Chapter 317 of this title (relating to Design Criteria Prior to 2008) or design criteria that preceded Chapter 317 of this title; and (B) systems regulated by Chapter 285 of this title (relating to On-Site Sewage Facilities); or collection systems or wastewater treatment facilities that collect, transport, treat, or dispose of wastewater that

does not have the characteristics of domestic wastewater, although the wastewater may contain domestic wastewater.

(b) The executive director may grant variances from new requirements added by the amendments of this chapter to a person who proposes to construct, alter, or re-rate a collection system or wastewater treatment facility if the plans and specifications for the project are submitted within 180 days after the date the amendments to this chapter are effective, provided the plans and specifications comply with the rules in effect immediately prior to the amendment. Adopted November 4, 2015 Effective December 4, 2015

**The link to the rules is available on the TCEQ website at <https://www.tceq.texas.gov/rules/indxpdf.html>**

***For Texas Students Only....***

Please sign and date this notice

Printed Name

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Signature

Date

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**Texas Students Only**  
**Acknowledgement of Notice of Potential Ineligibility for License**  
*You are required to sign and return to TLC or your credit will not be reported.*

Name: \_\_\_\_\_

Date of Birth: \_\_\_\_\_

Email Address: \_\_\_\_\_

By signing this form, I acknowledge that Technical Learning College notified me of the following:

- the potential ineligibility of an individual who has been convicted of an offense to be issued an occupational license by the Texas Commission on Environmental Quality (TCEQ) upon completion of the educational program;
- the current TCEQ Criminal Conviction Guidelines for Occupational Licensing, which describes the process by which the TCEQ's Executive Director determines whether a criminal conviction:
  - renders a prospective applicant an unsuitable candidate for an occupational license;
  - warrants the denial of a renewal application for an existing license; or
  - warrants revocation or suspension of a license previously granted.
- the right to request a criminal history evaluation from the TCEQ under Texas Occupations Code Section 53.102; and
- that the TCEQ may consider an individual to have been convicted of an offense for the purpose of denying, suspending or revoking a license under circumstances described in Title 30 Texas Administrative Code Section 30.33.

Enrollee Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name of Training Provider/Organization: Technical Learning College

Contact Person: Melissa Durbin      Role/Title: Dean

**Additional certificate for another Agency – additional fee \$50**

**All downloads are electronically tracked and monitored for security purposes.**

**Some States and many employers require the final exam to be proctored.**

<http://www.abctlc.com/downloads/PDF/PROCTORFORM.pdf>

# Confined Space Answer Key

Name \_\_\_\_\_

Phone# \_\_\_\_\_

**You are solely responsible that this course is accepted for credit by your State. Did you check with your State agency to ensure this course is accepted for credit?**

***Method of Course acceptance confirmation. Please fill this section***

**Do not solely depend on TLC's Approval list for it may be outdated.**

**Website \_\_\_ Telephone Call \_\_\_ Email \_\_\_ Spoke to \_\_\_\_\_**

**Did you receive the approval number, if applicable? \_\_\_\_\_**

**What is the course approval number, if applicable? \_\_\_\_\_**

***You are responsible to ensure that TLC receives the Assignment and Registration Key. Please call us to ensure that we received it. No refunds.***

***Please circle. Underline, bold or X the correct answer. Only one answer per question.***

- |                 |                 |                 |
|-----------------|-----------------|-----------------|
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| 2. A B C D E F  | 17. A B C D E F | 33. A B C D E F |
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55. A B C D E F      86. A B C D E F      117. A B C D E F  
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162. A B C D E F      193. A B C D E F      224. A B C D E F  
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167. A B C D E F      198. A B C D E F      229. A B C D E F  
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332. A B C D E F      363. A B C D E F      394. A B C D E F  
333. A B C D E F      364. A B C D E F      395. A B C D E F  
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335. A B C D E F      366. A B C D E F      397. A B C D E F  
336. A B C D E F      367. A B C D E F      398. A B C D E F  
337. A B C D E F      368. A B C D E F      399. A B C D E F  
338. A B C D E F      369. A B C D E F      400. A B C D E F  
339. A B C D E F      370. A B C D E F  
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357. A B C D E F      388. A B C D E F

***We will stop mailing the certificate of completion we need your e-mail address.  
We will e-mail the certificate to you, if no e-mail address; we will mail it to you.***

**CONFINED SPACE CEU TRAINING COURSE**  
**CUSTOMER SERVICE RESPONSE CARD**

NAME: \_\_\_\_\_

E-MAIL \_\_\_\_\_ PHONE \_\_\_\_\_

**PLEASE COMPLETE THIS FORM BY CIRCLING THE NUMBER OF THE APPROPRIATE ANSWER IN THE AREA BELOW.**

1. Please rate the difficulty of your course.  
Very Easy    0       1       2       3       4       5    Very Difficult

2. Please rate the difficulty of the testing process.  
Very Easy    0       1       2       3       4       5    Very Difficult

3. Please rate the subject matter on the exam to your actual field or work.  
Very Similar   0       1       2       3       4       5    Very Different

4. How did you hear about this Course? \_\_\_\_\_

5. What would you do to improve the Course?

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How about the price of the course?

Poor \_\_\_\_\_ Fair \_\_\_\_\_ Average \_\_\_\_\_ Good \_\_\_\_\_ Great \_\_\_\_\_

How was your customer service?

Poor \_\_\_\_\_ Fair \_\_\_\_\_ Average \_\_\_\_\_ Good \_\_\_\_\_ Great \_\_\_\_\_

Any other concerns or comments.

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***We will stop mailing the certificate of completion we need your e-mail address.  
We will e-mail the certificate to you, if no e-mail address; we will mail it to you.***

# Confined Space CEU Training Course Assignment

**The Assignment (Exam) is also available in Word on the Internet for your Convenience, please visit [www.ABCTLC.com](http://www.ABCTLC.com) and download the assignment and e- mail it back to TLC.**

You will have 90 days from the start of this course to complete in order to receive your Professional Development Hours (**PDHs**) or Continuing Education Unit (**CEU**). A score of 70 % is necessary to pass this course. We prefer if this exam is proctored. No intentional trick questions. If you should need any assistance, please email all concerns and the completed manual to [info@tlch2o.com](mailto:info@tlch2o.com).

We would prefer that you utilize the enclosed answer sheet in the front, but if you are unable to do so, type out your own answer key. Please include your name and address on your answer key and make copy for yourself. You can e-mail or fax your answer key along with the Registration Form to TLC. **(S) Means answer may be plural or singular. Multiple Choice Section, One answer per question and please use the answer key.**

## Confined Space Entry Program

### Purpose

1. The Confined Space Entry Program is provided to protect authorized employees that will enter confined spaces from safety or health hazards associated with confined spaces.  
A. True            B. False

### Scope

2. According to the text, you are required to recognize \_\_\_\_\_ associated with confined spaces.  
A. Internal configurations                      D. The dangers and hazards  
B. Hazardous atmospheres                    E. Atmospheric factors and physical agents  
C. Permit-Required Confined Spaces      F. None of the Above

## Definitions

### Confined space:

3. A confined space is large enough or so configured that an employee can \_\_\_\_\_.  
A. Have sufficient oxygen                      D. Recognize serious safety or health hazards  
B. Bodily enter and perform work            E. Continuously occupy the space  
C. See the internal configuration              F. None of the Above
4. A confined space has limited or restricted means for \_\_\_\_\_.  
A. An internal configuration                    D. Entry or exit  
B. Hazardous atmosphere                    E. Atmospheric factors and physical agents  
C. A safe working environment              F. None of the Above
5. A confined space is not designed for \_\_\_\_\_.  
A. Engulfing an entrant                        D. Recognized serious safety or health hazards  
B. Hazardous atmospheres                    E. Continuous employee occupancy  
C. An internal configuration                    F. None of the Above

6. A permit required confined space (permit space) contains or has a potential to contain a \_\_\_\_\_.
- A. Recognized internal configuration    D. Entry or exit  
 B. Hazardous atmosphere                E. Physical agent  
 C. Permit-Required Confined Space    F. None of the Above
7. A permit required confined space (permit space) contains a material that has \_\_\_\_\_.
- A. Authorized entrants                    D. Serious safety or health hazards  
 B. Hazardous atmospheres                E. Continuous employee occupancy  
 C. The potential for engulfing an entrant F. None of the Above
8. A permit required confined space (permit space) has an internal configuration such that \_\_\_\_\_ could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.
- A. An internal configuration                D. An entrant  
 B. Hazardous atmosphere                E. Atmospheric factors and physical agents  
 C. Equipment                                F. None of the Above
9. A permit required confined space (permit space) contains any other recognized serious safety or \_\_\_\_\_.
- A. Engulfing an entrant                    D. Health hazard  
 B. Hazardous atmospheres                E. Continuous employee occupancy  
 C. Internal configuration                F. None of the Above
10. Each \_\_\_\_\_ must be marked "Confined Space - Entry Permit Required".
- A. Internal configuration                    D. Entry or exit  
 B. Hazardous atmosphere                E. Atmospheric factor and physical agent  
 C. Permit-Required Confined Space    F. None of the Above

**Confined Space Hazards**

11. Fatalities and injuries constantly occur among construction workers who are required to enter \_\_\_\_\_.
- A. An internal configuration                D. Trenches  
 B. Hazardous atmosphere                E. Confined spaces  
 C. Ventilation ducts                        F. None of the Above
12. Workers encounter both inherent and \_\_\_\_\_ within confined workspaces.
- A. An internal configuration                D. Induced hazards  
 B. Hazardous atmosphere                E. Atmospheric factors and physical agents  
 C. Permit-Required Confined Spaces    F. None of the Above

**Inherent Hazards**

13. \_\_\_\_\_ are associated with specific types of equipment and the interactions among them. These hazards can be electrical, thermal, chemical, mechanical, etc.
- A. Inherent hazards                        D. Recognized serious safety or health hazards  
 B. Hazardous atmospheres                E. Continuous employee occupancies  
 C. Internal configurations                F. None of the Above



14. Inherent hazards include high voltage, radiation generated by equipment, \_\_\_\_\_, omission of protective features, high or low temperatures, high noise levels, and high-pressure vessels and lines.
- |                                    |  |
|------------------------------------|--|
| A. An internal configuration       | D. Defective design                        |
| B. Hazardous atmosphere            | E. Atmospheric factors and physical agents |
| C. Permit-Required Confined Spaces | F. None of the Above                       |
15. Inherent hazards usually cannot be eliminated without degrading or shutting down the system or equipment. Therefore, emphasis must be placed on \_\_\_\_\_.
- |                            |  |
|----------------------------|--|
| A. Hazard control methods  | D. Recognized serious safety or health hazards |
| B. Hazardous atmospheres   | E. Continuous employee occupancy               |
| C. Internal configurations | F. None of the Above                           |

**Induced Hazards**

16. \_\_\_\_\_ result from a multitude of incorrect decisions and actions that occur during the actual construction process.
- |                          |                                 |
|--------------------------|---------------------------------|
| A. Induced hazards       | D. Build-up of explosive gases  |
| B. Below-grade locations | E. Oxygen-deficient atmospheres |
| C. Vibrations            | F. None of the Above            |
17. Some examples of induced hazards are: omission of protective features, physical arrangements that may cause unintentional worker contact with electrical energy sources, oxygen-deficient atmospheres created at the bottom of pits or shafts, lack of safety factors in structural strength, and \_\_\_\_\_.
- |                           |                          |
|---------------------------|--------------------------|
| A. Common confined spaces | D. Extreme temperatures  |
| B. Hazards                | E. Flammable atmospheres |
| C. Vaults                 | F. None of the Above     |

**Typical Examples of Confined Workspaces**

18. Confined workspaces in construction contain \_\_\_\_\_.
- |                         |                                      |
|-------------------------|--------------------------------------|
| A. Purging agents       | D. Both inherent and induced hazards |
| B. Below-grade location | E. Pollution                         |
| C. Vibration            | F. None of the Above                 |

**Vaults**

19. Workers must enter \_\_\_\_\_ found on the construction jobsite to perform a number of functions.
- |                           |                                 |
|---------------------------|---------------------------------|
| A. Common confined spaces | D. Oxygen-deficient atmospheres |
| B. Hazards                | E. Low-voltage systems          |
| C. A variety of vaults    | F. None of the Above            |
20. The restricted nature of vaults and their frequently \_\_\_\_\_ are reasons that vaults have an assortment of safety and health problems.
- |                          |                                |
|--------------------------|--------------------------------|
| A. Purged atmosphere     | D. Explosive atmosphere        |
| B. Below-grade location  | E. Oxygen-deficient atmosphere |
| C. Above-ground location | F. None of the Above           |

### Oxygen-Deficient Atmosphere

21. The ever-present possibility of \_\_\_\_\_ is one of the major problems confronting construction workers while working in vaults.
- A. A common confined space
  - B. Hazards
  - C. Vaults
  - D. An oxygen-deficient atmosphere
  - E. Low-voltage systems
  - F. None of the Above

### Explosive or Toxic Gases, Vapors, or Fumes

22. \_\_\_\_\_ produce toxic fumes which are confined in the limited atmosphere of a confined space.
- A. Purging agents
  - B. Below-grade locations
  - C. Welding and soldering
  - D. Build-up of explosive gases
  - E. Oxygen-deficient atmospheres
  - F. None of the Above

### Electrical Shock

23. \_\_\_\_\_ results because the contractor has not provided an approved grounding system or the protection afforded by ground-fault circuit interrupters or low-voltage systems.
- A. Common confined space
  - B. Hazard
  - C. Electrical shock
  - D. An oxygen-deficient atmosphere
  - E. A low-voltage system
  - F. None of the Above

### Purging

24. Purging agents such as nitrogen and argon may enter a vault from adjacent areas. These agents may displace the oxygen in the vault and asphyxiate workers almost immediately.
- A. True
  - B. False

### Materials Falling In and On

25. According to the text, a \_\_\_\_\_ normally considered a problem associated with confined spaces is material or equipment which may fall into the vault.
- A. Common confined space
  - B. Hazard
  - C. Vault
  - D. Oxygen-deficient atmosphere
  - E. Rare occurrence
  - F. None of the Above
26. If the \_\_\_\_\_ were removed, materials could fall into the vault, causing injury to the workers inside.
- A. Purging agents
  - B. Below-grade locations
  - C. Manhole covers
  - D. Explosive gases
  - E. Oxygen-deficient atmospheres
  - F. None of the Above

### Condenser Pits

27. Because of their large size, condenser pits found in the construction of nuclear power plants are often overlooked as \_\_\_\_\_.
- A. Common confined spaces
  - B. Hazards
  - C. Vaults
  - D. Oxygen-deficient atmospheres
  - E. Potentially hazardous confined spaces
  - F. None of the Above

28. Condenser pits create large containment areas for the accumulation of toxic fumes and gases, or for the creation of \_\_\_\_\_ when purging with argon, Freon, and other inert gases.
- |                          |                                 |
|--------------------------|---------------------------------|
| A. Purging agents        | D. Build-up of explosive gases  |
| B. Below-grade locations | E. Oxygen-deficient atmospheres |
| C. Vibrations            | F. None of the Above            |
29. Workers above will create other \_\_\_\_\_ by dropping equipment, tools, and materials into the condenser pit.
- |                      |                            |
|----------------------|----------------------------|
| A. Hazards           | D. Problems with the pumps |
| B. Collection places | E. Oxygen deficiencies     |
| C. Heat sources      | F. None of the Above       |

### Manholes

30. Manholes are necessary to provide a means of entry into and exit from vaults, tanks, and pits, but these confined spaces may present \_\_\_\_\_ which could cause injuries and fatalities.
- |                      |                      |
|----------------------|----------------------|
| A. Electrical shock  | D. Welding fumes     |
| B. Ventilation ducts | E. Sumps             |
| C. Serious hazards   | F. None of the Above |
31. \_\_\_\_\_ are associated with manholes. For example, workers could fall into manholes when covers are missing.
- |                         |                            |
|-------------------------|----------------------------|
| A. Nitrogen purges      | D. Problems with the pumps |
| B. Collection places    | E. Oxygen deficiencies     |
| C. A variety of hazards | F. None of the Above       |

### Pipe Assemblies

32. The pipe assembly is one of the \_\_\_\_\_ encountered throughout the construction site,
- |                           |  |
|---------------------------|--|
| A. Electrical shock risks | D. Sources of welding fumes                              |
| B. Ventilation ducts      | E. Most frequently unrecognized types of confined spaces |
| C. Workspaces             | F. None of the Above                                     |
33. Once inside a pipe assembly, workers are faced with \_\_\_\_\_, often caused by purging with argon or another inert gas.
- |                              |   |
|------------------------------|---|
| A. Nitrogen purge or dry air | D. Potential oxygen-deficient atmospheres |
| B. Collection places         | E. Polluted air                           |
| C. Heat prostration          | F. None of the Above                      |
34. The worker in a pipe may be subject to toxic atmospheres from \_\_\_\_\_ generated by the worker in the pipe, or by other workers operating outside the pipe at either end.
- |                        |                      |
|------------------------|----------------------|
| A. Electrical shock    | D. Welding fumes     |
| B. Ventilation ducts   | E. Sumps             |
| C. Confined workspaces | F. None of the Above |

35. Pipes have \_\_\_\_\_ which provide little room for the workers to move about and gain any degree of comfort while performing their tasks.
- |                              |                                    |
|------------------------------|------------------------------------|
| A. Nitrogen purge or dry air | D. Problems with the pumps         |
| B. Collection places         | E. Generally restricted dimensions |
| C. Water sources             | F. None of the Above               |
36. \_\_\_\_\_ is another problem to which the worker is exposed when inside a pipe assembly.
- |                       |                      |
|-----------------------|----------------------|
| A. Electrical shock   | D. Welding fumes     |
| B. Ventilation ducts  | E. Sumps             |
| C. Confined workspace | F. None of the Above |
37. The worker may suffer \_\_\_\_\_ caused by heat within the pipe run.
- |                              |                            |
|------------------------------|----------------------------|
| A. Nitrogen purge or dry air | D. Problems with the pumps |
| B. Exposure to toxic gases   | E. Burns                   |
| C. Heat prostration          | F. None of the Above       |

### Ventilation Ducts

38. Ventilation ducts create a \_\_\_\_\_ which moves heated and cooled air and exhaust fumes to desired locations in the plant.
- |                     |                            |
|---------------------|----------------------------|
| A. Collection place | D. Shortcut to other areas |
| B. Complex network  | E. Sump                    |
| C. Workspace        | F. None of the Above       |
39. Depending on where the ventilation ducts are located, \_\_\_\_\_.
- |   |                                  |
|---|----------------------------------|
| A. Nitrogen purge or dry air may be found | D. Oxygen deficiency could exist |
| B. Collection places could exist          | E. Sumps may be encountered      |
| C. Cold air may be found                  | F. None of the Above             |
40. Other problems associated with work inside ventilation ducts are electrical shock hazards and \_\_\_\_\_.
- |                        |                      |
|------------------------|----------------------|
| A. Heat stress         | D. Welding fumes     |
| B. Water               | E. Sumps             |
| C. Confined workspaces | F. None of the Above |

### Tanks

41. Tanks are \_\_\_\_\_ that are used for a variety of purposes, including the storage of water and chemicals.
- |                             |                                       |
|-----------------------------|---------------------------------------|
| A. Nitrogen purge locations | D. Another type of confined workspace |
| B. Collection places        | E. Sumps                              |
| C. Vaults                   | F. None of the Above                  |
42. According to the text, oxygen-deficient atmospheres, along with toxic and explosive atmospheres created by the substances stored in the tanks, present hazards to workers.
- A. True      B. False
43. Heat in tanks may cause \_\_\_\_\_, particularly on a hot day.
- |                      |                        |
|----------------------|------------------------|
| A. Toxic fumes       | D. Problems with pumps |
| B. Equipment failure | E. Oxygen deficiency   |
| C. Heat prostration  | F. None of the Above   |

44. The \_\_\_\_\_ often requires workers to climb ladders to reach high places on the walls of the tank.
- |                               |                                   |
|-------------------------------|-----------------------------------|
| A. Electrical shock potential | D. Nature of the tank's structure |
| B. Ventilation duct           | E. Sump                           |
| C. Confined workspace         | F. None of the Above              |

### Sumps

45. Workers may encounter \_\_\_\_\_ when entering sumps.
- |                                   |                        |
|-----------------------------------|------------------------|
| A. Nitrogen purge or dry air      | D. Problems with pumps |
| B. An oxygen-deficient atmosphere | E. Construction debris |
| C. Heat prostration               | F. None of the Above   |
46. Because of the wet nature of the sump, the use of power tools inside may create \_\_\_\_\_ hazards.
- |                        |                      |
|------------------------|----------------------|
| A. Electrical shock    | D. Tripping          |
| B. Inadequate lighting | E. Falling           |
| C. Confined workspace  | F. None of the Above |

### Containment Cavities

47. Containment cavities are characterized by little or no air movement. Ventilation is always a problem, and the possibility of oxygen deficiency exists.
- A. True      B. False
48. Welding and other gases may easily collect in containment cavities, creating \_\_\_\_\_.
- |                        |                      |
|------------------------|----------------------|
| A. Toxic atmospheres   | D. High temperatures |
| B. Poor ventilation    | E. Low visibility    |
| C. Confined workspaces | F. None of the Above |

### Electrical Transformers

49. Before electrical transformers are opened, they must be \_\_\_\_\_ by pumping in air.
- |                      |                      |
|----------------------|----------------------|
| A. Nitrogen purged   | D. Well vented       |
| B. Collection places | E. Powered down      |
| C. Cooled down       | F. None of the Above |
50. Before entering a transformer, testing for \_\_\_\_\_ is mandatory.
- |  |                      |
|--|----------------------|
| A. Oxygen deficiency and for toxic atmospheres | D. Welding fumes     |
| B. Ventilation                                 | E. Hydrogen sulfide  |
| C. Confined workspace                          | F. None of the Above |

### Heat Sinks

51. Heat sinks are \_\_\_\_\_ in the event there is a problem with the pumps located at the plant water supply which would prevent cooling water from reaching the nuclear reactor core.
- |   |                            |
|---|----------------------------|
| A. Nitrogen purged                          | D. Pump locations          |
| B. Cold areas                               | E. Above-ground structures |
| C. Larger pit areas that hold cooling water | F. None of the Above       |

52. When inside the heat sink, workers are exposed to welding fumes and electrical hazards, particularly because water accumulates in the \_\_\_\_\_.
- |                       |                      |
|-----------------------|----------------------|
| A. Bottom of the sink | D. Pumps             |
| B. Ventilation ducts  | E. Equipment         |
| C. Workspace          | F. None of the Above |
53. It is difficult to communicate with workers in the \_\_\_\_\_ because radio signals are deadened by the rebar in the walls of the structure.
- |                      |                      |
|----------------------|----------------------|
| A. Dry air           | D. Pump station      |
| B. Collection places | E. Heat sink         |
| C. Ventilation ducts | F. None of the Above |

### Unusual Conditions

#### Confined Space within a Confined Space

54. One of the most hazardous confined spaces of all is a confined space within a confined space.
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|
55. The \_\_\_\_\_ associated with the outer confined space and those of the inner confined space both require testing, monitoring, and control.
- |                    |                      |
|--------------------|----------------------|
| A. Pumps           | D. Manholes          |
| B. Access passages | E. Potential hazards |
| C. Pits or vessels | F. None of the Above |
56. Often, only the outer space is evaluated for potential hazards. Workers are also faced with \_\_\_\_\_ when they enter the inner space.
- |                       |                                     |
|-----------------------|-------------------------------------|
| A. Poor lighting      | D. Potentially hazardous conditions |
| B. Excavations        | E. Construction debris              |
| C. Smaller work areas | F. None of the Above                |
57. Workers entering a vessel inside an access pit should do so only after both spaces have been evaluated and \_\_\_\_\_.
- |             |  |
|-------------|--|
| A. Purged   | D. Confined spaces eliminated          |
| B. Accessed | E. Proper control measures established |
| C. Opened   | F. None of the Above                   |

#### Hazards in One Space Entering another Space

58. According to the text, during an examination of \_\_\_\_\_, situations are often encountered which are not always easy to evaluate or control.
- |                |                                    |
|----------------|------------------------------------|
| A. Tanks       | D. Work areas                      |
| B. Excavations | E. Confined spaces in construction |
| C. Vaults      | F. None of the Above               |
59. A room which classifies as a confined space may be relatively safe for work. However, access passages from other areas outside or adjacent to the room could allow the transfer of \_\_\_\_\_ into the "safe" room.
- |                        |                         |
|------------------------|-------------------------|
| A. Noise               | D. Unauthorized workers |
| B. Equipment and tools | E. Hazardous agents     |
| C. Vibrations          | F. None of the Above    |

60. Welding fumes and other \_\_\_\_\_ generated in one room may easily travel through a pipe into another area, causing that area to change from a safe to an unsafe workplace.
- |                        |                      |
|------------------------|----------------------|
| A. Toxic materials     | D. Noise             |
| B. Construction debris | E. Problems          |
| C. Dust and dirt       | F. None of the Above |
61. In a situation where hazards in one space may enter another, a serious problem is that workers working in the "safe" area are not aware of the \_\_\_\_\_.
- |                          |                                    |
|--------------------------|------------------------------------|
| A. Oxygen Level          | D. Confined space                  |
| B. Access passages       | E. Hazards leaking into their area |
| C. Pit and/or the vessel | F. None of the Above               |

**Permitted Confined Space Entry Program**

62. Subpart P (of OSHA's Construction Regulations – refer to page 60) applies to all \_\_\_\_\_ in the earth's surface.
- |                     |                      |
|---------------------|----------------------|
| A. Open excavations | D. Pits              |
| B. Vaults           | E. Tanks             |
| C. Soil conditions  | F. None of the Above |
63. According to the text, all trenches are \_\_\_\_\_.
- |                        |                             |
|------------------------|-----------------------------|
| A. Too narrow for work | D. Safe for short-term work |
| B. Access passages     | E. Excavations              |
| C. Permit-required     | F. None of the Above        |
64. According to the text, all excavations are \_\_\_\_\_.
- |                    |                             |
|--------------------|-----------------------------|
| A. Permit-required | D. Access passages          |
| B. Not trenches    | E. Safe for short-term work |
| C. Workspaces      | F. None of the Above        |

**Permit Required Confined Space Entry General Rules**

65. According to the text, only authorized and trained employees may enter a \_\_\_\_\_ or act as safety watchmen/attendants.
- |                  |                      |
|------------------|----------------------|
| A. Hazard        | D. Confined space    |
| B. Pipe          | E. Jobsite           |
| C. Pit or vessel | F. None of the Above |
66. Employees are not permitted to smoke \_\_\_\_\_ or near the entrance/exit area.
- |                                 |                      |
|---------------------------------|----------------------|
| A. Near air and oxygen monitors | D. Unless permitted  |
| B. During a side entry          | E. For 8 hours       |
| C. In a confined space          | F. None of the Above |
67. A watchmen or attendant must be present at all times during \_\_\_\_\_.
- |                    |                           |
|--------------------|---------------------------|
| A. Hazards         | D. Air monitoring         |
| B. Access passages | E. Confined space entries |
| C. Construction    | F. None of the Above      |

68. According to the text, constant visual or voice communication will be maintained between the safety watchmen and employees entering \_\_\_\_\_.
- |                    |                      |
|--------------------|----------------------|
| A. Hazards         | D. A confined space  |
| B. Access passages | E. Inner spaces      |
| C. A pit or vessel | F. None of the Above |
69. According to the text, no \_\_\_\_\_ will be made or work conducted below the level of any hanging material or material which could cause engulfment.
- |                                 |  |
|---------------------------------|--|
| A. Monitoring of entrant status | D. Air and oxygen monitoring             |
| B. Bottom or side entry         | E. Identification of authorized entrants |
| C. Pre-entry requirements       | F. None of the Above                     |
70. \_\_\_\_\_ is required before workers are allowed to enter any permit-required confined space. Oxygen levels in the confined space must be between 19.5 and 23.5 percent.
- |                              |                      |
|------------------------------|----------------------|
| A. Air and oxygen monitoring | D. Communication     |
| B. A supervisor              | E. A rescue worker   |
| C. A hazard exposure test    | F. None of the Above |
71. Air and oxygen monitoring will check the levels of oxygen, explosive gasses, and carbon monoxide. Entry will not be permitted if explosive gas is detected above one-half the \_\_\_\_\_.
- |                   |                                |
|-------------------|--------------------------------|
| A. Nitrogen level | D. Lower Explosive Limit (LEL) |
| B. Argon level    | E. Oxygen limit                |
| C. Freon level    | F. None of the above           |
72. When covers are removed, all \_\_\_\_\_ will be protected by a barricade to prevent injuries to others.
- |                              |                                |
|------------------------------|--------------------------------|
| A. Air and oxygen monitoring | D. Openings to confined spaces |
| B. Side entries              | E. Permits                     |
| C. Bottom entries            | F. None of the Above           |

### **Confined Space Duties and Responsibilities**

#### **Employees**

73. Employees must not \_\_\_\_\_ that have not been evaluated for safety concerns.
- |                                |                                |
|--------------------------------|--------------------------------|
| A. Follow program requirements | D. Enter any confined spaces   |
| B. Report hazards              | E. Rescue unauthorized persons |
| C. Work on construction sites  | F. None of the above           |

#### **Management**

74. Management must provide annual confined space training to all employees that may need it.
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|
75. Management must annually review the confined space entry program and all entry permits.
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|



### Rescue or Training Department

76. The Rescue or Training Department must provide proper equipment for entry and rescue teams.  
A. True      B. False

### Entry Supervisor

77. Entry supervisors must coordinate all entry procedures, tests, \_\_\_\_\_, equipment, and other activities related to the permit space entry.  
A. Publicity      D. Contractors  
B. News media      E. Unauthorized persons  
C. Permits      F. None of the above
78. Before endorsing the permit and allowing entry to begin, the \_\_\_\_\_ must check that all appropriate entries have been made on the permit, all tests specified by the permit have been conducted, and that all procedures and equipment specified by the permit are in place.  
A. Entry supervisor      D. Entrants  
B. Attendant      E. Rescue workers  
C. Unauthorized persons      F. None of the above
79. The rescue workers must terminate the entry and cancel the permit when the entry is complete or there is a need for terminating the permit.  
A. True      B. False
80. The entry supervisor must verify that rescue services are available and that the means for summoning them are operable.  
A. True      B. False

### Entry Attendants

81. A responsibility of the entry attendant is to know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.  
A. True      B. False
82. A responsibility of the entry attendant is to be aware of \_\_\_\_\_ of hazard exposure on entrants.  
A. The attendants' primary duty      D. Consequences  
B. Worker training      E. Possible behavioral effects  
C. Hazard exposure on entrants      F. None of the Above
83. A responsibility of the entry attendant is to continuously maintain an accurate count of entrants in the permit space and ensure a means to \_\_\_\_\_.  
A. Timely complete the work      D. Provide safety training  
B. Remove unauthorized persons      E. Accurately identify authorized entrants  
C. Add workers when needed      F. None of the Above

84. A responsibility of the entry attendant is to remain outside the permit space during entry operations until \_\_\_\_\_.
- |                                  |                          |
|----------------------------------|--------------------------|
| A. Assistance is requested       | D. Rescue is needed      |
| B. Safety equipment arrives      | E. Oxygen level improves |
| C. Relieved by another attendant | F. None of the Above     |
85. A responsibility of the entry attendant is to \_\_\_\_\_ as necessary to monitor entrant status and alert entrants of the need to evacuate.
- |                                |                              |
|--------------------------------|------------------------------|
| A. Check the work progress     | D. Communicate with entrants |
| B. Encourage entrants          | E. Provide safety training.  |
| C. Meet pre-entry requirements | F. None of the Above         |
86. A responsibility of the entry attendant is to monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space, and order the entrants to immediately evacuate if the attendant detects a prohibited condition.
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|
87. A responsibility of the entry attendant is to summon rescue and other emergency services as soon as the attendant \_\_\_\_\_ to escape the permit space hazards.
- |  |  |
|--|--|
| A. Monitors entrant status                 | D. Notices the consequences of the exposure    |
| B. Gets approval to summon rescue          | E. Accurately identifies unauthorized entrants |
| C. Determines the entrants need assistance | F. None of the Above                           |
88. A responsibility of the entry attendant is to perform non-entry rescues as specified by that rescue procedure and entry supervisor.
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|

**Duties of the Person Authorizing or in Charge of the Entry**

89. If the person who would otherwise issue an entry permit is in charge of the entry and present during the entire entry, a written permit is still required even if that person uses a checklist.
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|
90. The person in charge of the entry may also serve as the \_\_\_\_\_ at the site.
- |                      |                      |
|----------------------|----------------------|
| A. Worker            | D. Rescue team       |
| B. Attendant         | E. Entrant           |
| C. Authorized person | F. None of the Above |

**Special Considerations During A Permit Required Entry**

91. Welding, drilling, or sludge removal work being performed in a permit entry confined space could cause the atmosphere in the space to change.
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|
92. In situations such as welding, drilling, or sludge removal, continuous air monitoring of the confined space throughout the time of the entry is not required.
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|

93. If the \_\_\_\_\_ leave the confined space for any significant period of time, the atmosphere of the confined space must be retested before the workers are allowed to reenter the confined space.
- |                         |                          |
|-------------------------|--------------------------|
| A. Workers              | D. Rescue team personnel |
| B. Attendants           | E. Inspectors            |
| C. Unauthorized persons | F. None of the Above     |

**Unauthorized Persons**

94. Actions must be taken when \_\_\_\_\_ approach or enter a permit space while entry is under way.
- |                         |                                     |
|-------------------------|-------------------------------------|
| A. Authorized workers   | D. Authorized and trained employees |
| B. Rescue Workers       | E. Entrants                         |
| C. Unauthorized persons | F. None of the Above                |
95. \_\_\_\_\_ must be warned to stay away from the permit space,
- |                         |                                     |
|-------------------------|-------------------------------------|
| A. Authorized workers   | D. Authorized and trained employees |
| B. Rescue Workers       | E. Entrants                         |
| C. Unauthorized persons | F. None of the Above                |
96. If \_\_\_\_\_ have entered the space, they must be advised to exit immediately.
- |                         |                                     |
|-------------------------|-------------------------------------|
| A. Authorized workers   | D. Authorized and trained employees |
| B. Rescue Workers       | E. Entrants                         |
| C. Unauthorized persons | F. None of the Above                |
97. If unauthorized persons have entered the permit space, inform the \_\_\_\_\_ and the entry supervisor.
- |                         |                        |
|-------------------------|------------------------|
| A. Security personnel   | D. Authorized entrants |
| B. Attendant            | E. Rescue workers      |
| C. Unauthorized persons | F. None of the Above   |

**Entrants**

98. According to the text, all \_\_\_\_\_ must be authorized by the entry supervisor to enter permit spaces, have received the required training, have used the proper equipment, and observed the entry procedures and permit requirements
- |                         |                      |
|-------------------------|----------------------|
| A. Workers              | D. Skilled workers   |
| B. Attendants           | E. Entrants          |
| C. Unauthorized persons | F. None of the Above |
99. Entrants are required to know the \_\_\_\_\_ that may be faced during entry.
- |                         |                                     |
|-------------------------|-------------------------------------|
| A. Confined spaces      | D. Authorized and trained employees |
| B. Hazards              | E. Entrants                         |
| C. Unauthorized persons | F. None of the Above                |
- 100 Entrants must know information on the mode, signs or symptoms, and consequences of exposure.
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|

101. Entrants are required to communicate with the \_\_\_\_\_ as necessary to enable the attendant to monitor their status and alert them of the need to evacuate the space if necessary.
- |                         |                      |
|-------------------------|----------------------|
| A. Inspectors           | D. Rescue team       |
| B. Attendant            | E. Skilled workers   |
| C. Unauthorized persons | F. None of the Above |
102. Entrants are required to alert the attendant whenever the entrant recognizes any warning signs or symptoms of exposure to a dangerous situation, or whenever any prohibited condition is detected.
- A. True      B. False
103. Entrants must exit the permit space as quickly as possible when given an order to evacuate by the attendant or entry supervisor.
- A. True      B. False

**Permit Required Confined Space Entry General Rules**

**Confined Space Entry Permits**

104. According to the text, Confined Space Entry Permits must be completed before any employee \_\_\_\_\_.
- |                       |  |
|-----------------------|--|
| A. Begins work        | D. Enters a permit-required confined space |
| B. Leaves for the day | E. Leaves the permit space                 |
| C. Takes vacation     | F. None of the Above                       |
105. Before entry, the Confined Space Entry Permit must be completed and signed by an authorized member of management.
- A. True      B. False
106. \_\_\_\_\_ will expire before the shift is completed or if any pre-entry conditions change.
- |                              |                                 |
|------------------------------|---------------------------------|
| A. Air and oxygen monitoring | D. Confined Space Entry Permits |
| B. Side entries              | E. Project schedules            |
| C. Confined spaces           | F. None of the Above            |
107. \_\_\_\_\_ will be maintained on file for 12 months.
- |                                   |                                 |
|-----------------------------------|---------------------------------|
| A. Air and oxygen monitoring data | D. Confined Space Entry Permits |
| B. Entry logs                     | E. Project schedules            |
| C. A list of confined spaces      | F. None of the Above            |

**Contractor Entry**

108. According to the text, all work by \_\_\_\_\_ that involves the entry into confined spaces will follow the procedures of this program.
- |                         |                          |
|-------------------------|--------------------------|
| A. Management           | D. Non-company employees |
| B. Supervisors          | E. Physicians            |
| C. Unauthorized persons | F. None of the Above     |
109. Specific hazards of the confined spaces to be entered must be provided to contractor management prior to beginning entry or work.
- A. True      B. False

### Confined Space Training and Education

110. According to the text, OSHA's General Industry Regulation, §1910.146 Permit-required confined spaces, contains requirements for practices and procedures to protect employees in general industry from the hazards of entry into permit-required confined spaces. This regulation does not apply to construction.  
A. True            B. False
111. According to the text, OSHA's Construction Safety and Health Regulations Part 1926 do not contain a permit-required confined space regulation. Subpart C, §1926.21 Safety training and education specifies training for personnel who are required to enter confined spaces and defines a "confined or enclosed space."  
A. True            B. False

### §1926.21 Safety training and education. (Partial)

112. §1926.21(b)(6)(i) states: All employees required to enter into confined or enclosed spaces shall be instructed as to the nature of the hazards involved, the necessary precautions to be taken, and in the use of protective and emergency equipment required. The employer shall comply with any specific regulations that apply to work in dangerous or potentially dangerous areas.  
A. True            B. False
113. According to §1926.21(b)(6)(ii), " \_\_\_\_\_ " means any space having a limited means of egress, which is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere.  
A. Confined or enclosed space            D. Hazardous work area  
B. Confined space hazard                E. Nature of the hazard  
C. An unauthorized entry                F. None of the Above
114. According to §1926.21(b)(6)(ii), \_\_\_\_\_ include, but are not limited to, storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, and pipelines.  
A. Confined or enclosed spaces            D. Hazardous work areas  
B. Confined space hazards                E. Hazards  
C. Unauthorized entries                F. None of the Above
115. OSHA's Construction Regulations also contain requirements dealing with \_\_\_\_\_ in underground construction, underground electric transmission and distribution work, excavations, and welding and cutting.  
A. Confined or enclosed spaces            D. Hazardous work areas  
B. Confined space hazards                E. Construction workers  
C. Unauthorized entries                F. None of the Above
116. American National Standard ANSI Z117.1-1989, Safety Requirements for Confined Spaces, provides \_\_\_\_\_ to be followed while entering, exiting and working in confined spaces at normal atmospheric pressure.  
A. Guidelines                                D. Documentation  
B. Suggestions                               E. Minimum safety requirements  
C. Directions                                F. None of the Above

## Your Employer is Responsible for Certain Training Requirements

### GENERAL

117. It is the responsibility of your employer to ensure that all workers who must enter a permit entry confined space in the course of their work are informed of appropriate procedures and controls for entry into such spaces.
- A. True          B. False

### TRAINING FOR AUTHORIZED ENTRANTS

118. Your employer must ensure that all authorized entrants have received appropriate training prior to entering any permit entry confined space.
- A. True          B. False
119. Each worker must be trained to recognize hazards before entering and must understand the need to perform \_\_\_\_\_ to determine if it is safe to enter.
- A. A permit review                          D. Appropriate testing  
B. Plan review                                  E. Additional training  
C. Background checks                        F. None of the above
120. Each worker must be taught how to properly use all personal protective equipment required for entry or rescue. Workers must also be taught how to properly use \_\_\_\_\_ and shields.
- A. Air monitors                                  D. Protective barriers  
B. Tripods     E. Manuals  
C. Training                                         F. None of the Above
121. Each worker must be trained to evacuate the confined space as rapidly as possible without help whenever ordered by the attendant, whenever \_\_\_\_\_, or whenever workers recognize the warning signs of exposure to substances in the confined space.
- A. The shift ends                                  D. An automatic evacuation alarm is activated  
B. More help is needed                         E. The task is completed  
C. The attendant leaves                         F. None of the Above
122. \_\_\_\_\_ must be trained in any special work practices or procedures that are necessary for permit entry confined space work.
- A. Unauthorized persons                        D. Contractors  
B. Each worker                                    E. Each entry supervisor  
C. Each attendant                                F. None of the Above

### TRAINING FOR PERSONS AUTHORIZING OR IN CHARGE OF ENTRY

123. According to the text, the person authorizing or in charge of entry shall be trained to recognize the effects of exposure to hazards that could be in the confined space.
- A. True          B. False

### TRAINING FOR ATTENDANT

124. The attendant at a permit entry confined space must be trained in the company's emergency action plan.
- A. True          B. False

125. The attendant at a permit entry confined space must be trained in the proper use of the communications equipment furnished for communicating with \_\_\_\_\_ entering the confined space or for summoning emergency or rescue services.
- |                         |                       |
|-------------------------|-----------------------|
| A. Contractors          | D. Authorized workers |
| B. Unauthorized persons | E. Entry supervisors  |
| C. Attendants           | F. None of the Above  |
126. The attendant at a permit entry confined space must be trained in \_\_\_\_\_ for summoning rescue or other emergency services.
- |                        |                          |
|------------------------|--------------------------|
| A. Assigning personnel | D. Authorized procedures |
| B. Using contractors   | E. Hazards               |
| C. Calling supervisors | F. None of the Above     |
127. The attendant at a permit entry confined space must be trained to recognize the unusual actions of \_\_\_\_\_ which could indicate that they could be experiencing a toxic reaction to contaminants that could be present in the space.
- |                         |                        |
|-------------------------|------------------------|
| A. Contractors          | D. A worker            |
| B. Unauthorized persons | E. An entry supervisor |
| C. An attendant         | F. None of the Above   |
128. The attendant at a permit entry confined space must have rescuer training if the \_\_\_\_\_ will function as a rescuer also.
- |               |                      |
|---------------|----------------------|
| A. Contractor | D. Worker            |
| B. Paramedics | E. Entry supervisor  |
| C. Attendant  | F. None of the Above |
129. The attendant at a permit entry confined space must have the same training as the workers who enter the confined space, if the permit specifies that the duty of the attendant will rotate among the \_\_\_\_\_ authorized to enter the confined space.
- |                |                      |
|----------------|----------------------|
| A. Contractors | D. Workers           |
| B. Rescuers    | E. Entry supervisors |
| C. Paramedics  | F. None of the Above |

**Other Hazards**

**Flammable Atmospheres**

130. Enriched oxygen atmospheres, vaporization of flammable liquids, byproducts of work, and chemical reactions can all create \_\_\_\_\_.
- |                       |                                    |
|-----------------------|------------------------------------|
| A. Confined spaces    | D. A flammable atmosphere          |
| B. Chemical reactions | E. Permit required confined spaces |
| C. Low visibility     | F. None of the Above               |
131. When there is inadequate ventilation in a confined space, combustible gases or vapors will accumulate.
- A. True      B. False
132. Since many gases are \_\_\_\_\_, they will seek lower levels as in pits, sewers, and various types of storage tanks and vessels.
- |                   |                      |
|-------------------|----------------------|
| A. Found in tanks | D. Toxic substances  |
| B. Vapors         | E. Heavier than air  |
| C. Explosive      | F. None of the Above |

133. Lighter than air gases may rise and develop a \_\_\_\_\_ if trapped above the opening in a closed top tank.
- |                            |                                      |
|----------------------------|--------------------------------------|
| A. Toxic cloud             | D. High charge of static electricity |
| B. Toxic atmosphere        | E. Spontaneous chemical reaction     |
| C. Flammable concentration | F. None of the Above                 |
134. Flammable or explosive conditions within a confined space can be generated from the \_\_\_\_\_.
- |                         |                                  |
|-------------------------|----------------------------------|
| A. Atmosphere           | D. Liberated toxic substances    |
| B. Chemical reactions   | E. Byproducts of work procedures |
| C. Explosive conditions | F. None of the Above             |
135. According to the text, \_\_\_\_\_ in a confined space is a major cause of explosions in areas that contain combustible gas.
- |                    |                                       |
|--------------------|---------------------------------------|
| A. Toxic fumes     | D. High charges of static electricity |
| B. Toxic chemicals | E. Spontaneous chemical reactions     |
| C. Welding         | F. None of the Above                  |
136. An example of a chemical reaction forming a flammable atmosphere is when dilute sulfuric acid reacts with iron to form \_\_\_\_\_.
- |              |                      |
|--------------|----------------------|
| A. Nitrogen  | D. Toxic substances  |
| B. Hydrogen  | E. Ferrous oxide     |
| C. Acetylene | F. None of the Above |
137. In a dry state, compounds such as acetylene-metal compounds, peroxides, and nitrates have the potential to explode upon percussion or exposure to \_\_\_\_\_.
- |                             |                                       |
|-----------------------------|---------------------------------------|
| A. Toxic fumes              | D. High charges of static electricity |
| B. Work in a confined space | E. Increased temperature              |
| C. Atmosphere               | F. None of the Above                  |
138. Another class of chemical reactions that form flammable atmospheres arise from deposits of carbon, ferrous oxide, ferrous sulfate, iron, etc. that can be found in tanks used by the chemical and petroleum industry.
- A. True      B. False
139. According to the text, \_\_\_\_\_ are usually found during the process of loading, unloading, and conveying grain products, nitrated fertilizers, finely ground chemical products, and any other combustible material.
- |                                    |                                       |
|------------------------------------|---------------------------------------|
| A. Toxic fumes                     | D. High charges of static electricity |
| B. Confined spaces                 | E. Spontaneous chemical reactions     |
| C. Combustible dust concentrations | F. None of the Above                  |
140. High charges of static electricity can cause certain substances to \_\_\_\_\_ of sufficient energy to produce sparks and ignite a flammable atmosphere.
- |                     |                                     |
|---------------------|-------------------------------------|
| A. Release hydrogen | D. Liberate toxic substances        |
| B. Form compounds   | E. Accumulate electrostatic charges |
| C. Create vapors    | F. None of the Above                |



141. When the right air or oxygen to dust or gas mixture is present, sparks may also \_\_\_\_\_.
- A. Produce toxic fumes
  - B. Be present in a confined space
  - C. Cause explosions
  - D. Release energy
  - E. Cause spontaneous chemical reactions
  - F. None of the Above

### Toxic Atmospheres

142. The entire spectrum of gases, vapors, and finely-divided airborne dust in industry can be regarded as \_\_\_\_\_.
- A. Present in a confined space
  - B. Toxic in a confined space
  - C. Welding fumes
  - D. High charges of static electricity
  - E. Spontaneous chemical reactions
  - F. None of the Above
143. The sources of toxic atmospheres encountered may arise from: 1. The manufacturing process; 2. The product stored; or 3. The \_\_\_\_\_ in the confined space.
- A. Toxic fumes
  - B. Conditions
  - C. Operation performed
  - D. High charges of static electricity
  - E. Spontaneous chemical reactions
  - F. None of the Above
144. Mechanical and/or human error during loading, unloading, formulation, and production may also produce toxic gases which are \_\_\_\_\_.
- A. Found in tanks
  - B. Reactive
  - C. Corrosive
  - D. Non-toxic
  - E. Not part of the planned operation
  - F. None of the Above
145. Carbon monoxide (CO) is a hazardous gas that is usually not found in a confined space.
- A. True
  - B. False
146. Carbon monoxide (CO) is an odorless, colorless gas that is formed from \_\_\_\_\_ such as wood, coal, gas, oil, and gasoline.
- A. Organic materials
  - B. CO<sub>2</sub>
  - C. Nitrogen
  - D. Decomposition of organic matter
  - E. Incomplete combustion of organic materials
  - F. None of the Above
147. CO is an insidious toxic gas because of its poor warning properties. CO may be fatal at as little as 1000 ppm or 10% in air, and is considered dangerous at 200 ppm or 2%.
- A. True
  - B. False
148. According to the text, CO is a relatively abundant colorless, odorless gas. Therefore, any untested atmosphere must be suspect. It must also be noted that a safe reading on a combustible gas indicator does not ensure that CO is not present.
- A. True
  - B. False
149. Because CO may form as a result of chemical reactions or work activities, fatalities due to CO poisoning are not confined to \_\_\_\_\_.
- A. Confined spaces
  - B. Any particular industry
  - C. Vaults
  - D. Tanks
  - E. Welding
  - F. None of the Above

150. Carbon monoxide results as a product of \_\_\_\_\_ when silo gas forms in grain storage elevators.
- |                      |                      |
|----------------------|----------------------|
| A. Organic materials | D. Decomposition     |
| B. CO <sub>2</sub>   | E. Combustion        |
| C. Nitrogen          | F. None of the Above |
151. Increased \_\_\_\_\_ levels resulting from the recirculation of diesel exhaust emissions can be prevented by strict control of the ventilation and the use of catalytic converters.
- |             |                      |
|-------------|----------------------|
| A. Organic  | D. Pollution         |
| B. CO       | E. Toxic gas         |
| C. Nitrogen | F. None of the Above |

**Procedures for Atmospheric Testing - 1910.146 App B**

**OSHA Requirement**

**Sub-Part Title: General Environmental Controls**

152. According to text, atmospheric testing is required for two distinct purposes: \_\_\_\_\_ and verification that acceptable entry conditions for entry into that space exist.
- |                               |  |
|-------------------------------|--|
| A. Planning rescue operations | D. Selecting safety equipment                    |
| B. Scheduling work            | E. Evaluation of the hazards of the permit space |
| C. Choosing trained personnel | F. None of the Above                             |
153. According to 1910.146 App B, (1) Evaluation testing: The atmosphere of a confined space should be analyzed \_\_\_\_\_ to identify and evaluate any hazardous atmospheres that may exist or arise, so that appropriate permit entry procedures can be developed and acceptable entry conditions stipulated for that space.
- |                              |  |
|------------------------------|--|
| A. For primary irritants     | D. Hourly  |
| B. For combustible gases     | E. Using equipment of sufficient sensitivity and specificity |
| C. For corrosive atmospheres | F. None of the Above   |
154. Evaluation and interpretation of these data, and development of the entry procedure, should be done by, or reviewed by, a technically qualified professional based on evaluation of all serious hazards.
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|
155. According to 1910.146 App B, (2) Verification testing: The atmosphere of a permit space which may contain a hazardous atmosphere should be tested for residues of all contaminants identified by evaluation testing using permit specified equipment to determine that residual concentrations at the time of testing and entry are within the range of acceptable entry conditions.
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|
156. Results of testing should be recorded on the permit in the space provided adjacent to the stipulated \_\_\_\_\_.
- |                                      |                               |
|--------------------------------------|-------------------------------|
| A. Descent into atmospheres          | D. Acceptable entry condition |
| B. Evaluation of all serious hazards | E. Corrosive atmospheres      |
| C. Oxygen deficient atmosphere       | F. None of the Above          |

157. According to 1910.146 App B, (3) Duration of testing: Measurement of values for \_\_\_\_\_ should be made for at least the minimum response time of the test instrument specified by the manufacturer.
- |                          |   |
|--------------------------|---|
| A. Primary irritants     | D. Sampling speed and detector response |
| B. Combustible gases     | E. Each atmospheric parameter           |
| C. Corrosive atmospheres | F. None of the Above                    |
158. According to 1910.146 App B, (4) Testing stratified atmospheres: When monitoring for entries involving a descent into atmospheres that may be stratified, the \_\_\_\_\_ should be tested a distance of approximately 4 feet (1.22 m) in the direction of travel and to each side.
- |                                      |                               |
|--------------------------------------|-------------------------------|
| A. Descent into atmospheres          | D. Acceptable entry condition |
| B. Evaluation of all serious hazards | E. Corrosive atmosphere       |
| C. Atmospheric envelope              | F. None of the Above          |
159. If a sampling probe is used, rate of progress of the entrant should be slowed to accommodate the \_\_\_\_\_.
- |                          |   |
|--------------------------|---|
| A. Primary irritants     | D. Sampling speed and detector response |
| B. Combustible gases     | E. Atmospheric parameters               |
| C. Corrosive atmospheres | F. None of the Above                    |
160. According to 1910.146 App B, (5) Order of testing: A test for oxygen is performed first because most combustible gas meters are oxygen dependent and will \_\_\_\_\_ in an oxygen deficient atmosphere.
- |                                     |                                       |
|-------------------------------------|---------------------------------------|
| A. Not be used                      | D. Signal acceptable entry conditions |
| B. Not evaluate all serious hazards | E. Not provide reliable readings      |
| C. Not work at all                  | F. None of the Above                  |
161. After testing for oxygen, combustible gases are tested for next. If tests for toxic gases and vapors are necessary, they are performed last.
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|

**Irritant (Corrosive) Atmospheres**

162. According to the text, irritant or corrosive atmospheres can be \_\_\_\_\_.
- |                          |  |
|--------------------------|--|
| A. Primary irritants     | D. Difficult to detect                       |
| B. Combustible gases     | E. Divided into primary and secondary groups |
| C. Corrosive atmospheres | F. None of the Above                         |
163. A primary irritant is one that may produce systemic toxic effects in addition to surface irritation.
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|
164. Chlorine, ozone, hydrochloric acid, hydrofluoric acid, sulfuric acid, nitrogen dioxide, ammonia, and sulfur dioxide are examples of \_\_\_\_\_.
- |                          |                           |
|--------------------------|---------------------------|
| A. Primary irritants     | D. Detector responses     |
| B. Combustible gases     | E. Atmospheric parameters |
| C. Corrosive atmospheres | F. None of the Above      |

165. \_\_\_\_\_ may produce systemic toxic effects in addition to surface irritation.
- |                                      |                                |
|--------------------------------------|--------------------------------|
| A. A secondary irritant              | D. Acceptable entry conditions |
| B. Evaluation of all serious hazards | E. Corrosive atmospheres       |
| C. An oxygen deficient atmosphere    | F. None of the Above           |
166. Benzene, carbon tetrachloride, ethyl chloride, trichloroethane, trichloroethylene, and chloropropene are examples of \_\_\_\_\_.
- |                          |                           |
|--------------------------|---------------------------|
| A. Primary irritants     | D. Secondary irritants    |
| B. Combustible gases     | E. Atmospheric parameters |
| C. Corrosive atmospheres | F. None of the Above      |
167. \_\_\_\_\_ can be found in plastics plants, chemical plants, the petroleum industry, tanneries, refrigeration industries, paint manufacturing, and mining operations.
- |                       |                      |
|-----------------------|----------------------|
| A. Chemical reactions | D. Irritant gases    |
| B. Normal atmosphere  | E. Nitrogen          |
| C. Carbon dioxide     | F. None of the Above |
168. According to the text, prolonged exposure at irritant or corrosive concentrations in a confined space may produce \_\_\_\_\_.
- |                         |   |
|-------------------------|---|
| A. Oxygen deprivation   | D. Little or no evidence of irritation  |
| B. Oxygen by nitrogen   | E. Irritant or corrosive concentrations |
| C. Flammable substances | F. None of the Above                    |

### Asphyxiating Atmospheres

169. The composition of \_\_\_\_\_ is approximately 20.9% oxygen, 78.1% nitrogen, and 1% argon with small amounts of various other gases.
- |                       |                      |
|-----------------------|----------------------|
| A. Chemical reactions | D. Irritant gases    |
| B. Normal atmosphere  | E. Nitrogen          |
| C. Carbon dioxide     | F. None of the Above |
170. Oxygen is consumed during \_\_\_\_\_, as in welding, heating, cutting, and brazing.
- |                       |                                       |
|-----------------------|---------------------------------------|
| A. Oxygen deprivation | D. Combustion of flammable substances |
| B. Oxygen by nitrogen | E. Confined space entry               |
| C. Air monitoring     | F. None of the Above                  |
171. Oxygen may also be consumed during chemical reactions such as the formation of rust (iron oxide).
- A. True      B. False
172. Helium, argon, and nitrogen are examples of gases that are used to displace air, and therefore reduce the oxygen level.
- A. True      B. False
173. \_\_\_\_\_ may also be used to displace air. This gas can occur naturally in sewers, storage bins, wells, tunnels, wine vats, and grain elevators.
- |                       |                      |
|-----------------------|----------------------|
| A. Chemical reactions | D. Irritant gases    |
| B. Normal atmosphere  | E. Blowers           |
| C. Carbon dioxide     | F. None of the Above |

174. Certain gases are also used as inerting agents to displace flammable substances and \_\_\_\_\_.

- A. Oxygen deprivation
- B. Oxygen by nitrogen
- C. Flammable substances
- D. Toxic gases
- E. Retard pyrophoric reactions
- F. None of the Above

175. Although nitrogen is frequently referred to as a non-toxic inert gas, the use of \_\_\_\_\_ to inert a confined space has claimed more lives than carbon dioxide.

- A. Chemical reactions
- B. Normal atmosphere
- C. Carbon dioxide
- D. Irritant gases
- E. Nitrogen
- F. None of the Above

176. The total displacement of \_\_\_\_\_ will cause immediate death.

- A. Toxic atmosphere
- B. Oxygen by nitrogen
- C. Toxic gases
- D. Flammable substances
- E. Irritant or corrosive concentrations
- F. None of the Above

### Carbon Dioxide

177. Since \_\_\_\_\_ have specific gravities greater than air, these gases may lie in a tank or manhole for hours or days after opening.

- A. Chemical reactions
- B. Normal atmospheres
- C. Toxic gases
- D. Carbon dioxide and argon
- E. Irritant gases
- F. None of the Above

### Oxygen Deprivation

178. Oxygen deprivation is a form of \_\_\_\_\_.

- A. Oxygen deprivation
- B. Oxygen by nitrogen
- C. Toxic gas
- D. Combustion
- E. Asphyxiation
- F. None of the Above

179. The first sign of hypoxia (oxygen deprivation) is deterioration to night vision, which occurs when the \_\_\_\_\_ level falls to 17%.

- A. Argon
- B. Oxygen
- C. Carbon dioxide
- D. Irritant gases
- E. Nitrogen
- F. None of the Above

180. Increased breathing volume, accelerated heartbeat, very poor muscular coordination, rapid fatigue, and intermittent respiration are \_\_\_\_\_ that occur when oxygen level is between 14-16%.

- A. Problems
- B. Physiologic effects
- C. Obstacles
- D. Reactions
- E. Irritants
- F. None of the Above

181. Nausea, vomiting, \_\_\_\_\_, and unconsciousness are the physiological effects that occur when oxygen level is between 6-10%. Less than 6%, the effects are spasmodic breathing, convulsive movements, and death in minutes.

- A. Oxygen deprivation
- B. Problems
- C. Obstacles
- D. Reactions
- E. Inability to perform
- F. None of the Above

### Mechanical Hazards

182. According to the text, if activation of electrical or mechanical equipment would cause injury, each piece of equipment should be manually isolated to \_\_\_\_\_ before workers enter or while they work in a confined space.
- A. Operate separately
  - B. Prevent fumes
  - C. Reduce noise
  - D. Inert the atmosphere
  - E. Prevent inadvertent activation
  - F. None of the Above
183. The interplay of \_\_\_\_\_ associated with a confined space, such as flammable vapors or gases being present and the build-up of static charge due to mechanical cleaning, all influence the precautions which must be taken.
- A. Noise problems
  - B. General hypothermia
  - C. Hazards
  - D. Four factors
  - E. Flammable vapors or gases
  - F. None of the Above
184. Workers should completely isolate the space to prevent \_\_\_\_\_, flashbacks, and other hazards
- A. Moisture content
  - B. Physiologic mechanisms
  - C. Intensified noise
  - D. Vapor leaks
  - E. Hot and cold environments
  - F. None of the Above
185. In cases where \_\_\_\_\_ may re-contaminate the confined space, other special precautions must be taken.
- A. Moisture content
  - B. General hypothermia
  - C. Intensified noise
  - D. Four factors
  - E. Flammable liquids or vapors
  - F. None of the Above
186. The space referred to as a void, such as double walled vessels, is a less apparent hazard which must be given special consideration in \_\_\_\_\_.
- A. Moisture content
  - B. Physiologic mechanisms
  - C. Intensified noise
  - D. Blanking off and inerting
  - E. Hot and cold environments
  - F. None of the Above

### Thermal Effects

187. Four factors that influence the interchange of heat between people and their environment are: (1) \_\_\_\_\_, (2) air velocity, (3) moisture contained in the air, and (4) radiant heat.
- A. Noise problems
  - B. General hypothermia
  - C. Intensified noise
  - D. Four factors
  - E. Air temperature
  - F. None of the Above
188. Due to the nature and design of most confined spaces, moisture content and \_\_\_\_\_ are difficult to control.
- A. Radiant heat
  - B. Physiologic mechanisms
  - C. Intensified noise
  - D. Blanking off and inerting
  - E. Hot and cold environments
  - F. None of the Above

189. Workers will continue to function until the \_\_\_\_\_ rises to approximately 102°F.
- |                        |                      |
|------------------------|----------------------|
| A. Noise problem       | D. Thermal effect    |
| B. General hypothermia | E. Body temperature  |
| C. Environment         | F. None of the Above |
190. Certain \_\_\_\_\_ come into play in a cold environment, which tend to limit heat loss and increase heat production.
- |                           |                              |
|---------------------------|------------------------------|
| A. Situations             | D. Precautions               |
| B. Physiologic mechanisms | E. Hot and cold environments |
| C. Environments           | F. None of the Above         |
191. Special precautions must be taken when working in \_\_\_\_\_ to prevent frostbite, trench foot, and general hypothermia.
- |                        |                      |
|------------------------|----------------------|
| A. Situations          | D. Confined spaces   |
| B. General hypothermia | E. Cold environments |
| C. Tanks               | F. None of the Above |

**Protective Insulated Clothing**

192. According to the text, protective insulated clothing for both \_\_\_\_\_ will add additional bulk to the worker and must be considered in allowing for movement in the confined space and exit time.
- |                           |                              |
|---------------------------|------------------------------|
| A. Working Conditions     | D. Blanking off and inerting |
| B. Physiologic mechanisms | E. Hot and cold environments |
| C. Situations             | F. None of the Above         |

**Noise**

193. The interior of confined spaces tends to cause sound to reverberate and thus expose the worker to \_\_\_\_\_ than those found in an open environment.
- |                            |                        |
|----------------------------|------------------------|
| A. Lower hearing-loss risk | D. More factors        |
| B. Reduced noise           | E. Higher sound levels |
| C. Less hazards            | F. None of the Above   |
194. Workers may experience temporary or permanent loss of hearing from \_\_\_\_\_.
- |                           |                              |
|---------------------------|------------------------------|
| A. Moisture content       | D. Blanking off and inerting |
| B. Physiologic mechanisms | E. Hot and cold environments |
| C. Intensified noise      | F. None of the Above         |
195. The probability of severe accidents can increase if the workers inside are not able to hear commands or danger signals due to excessive noise.
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|

**Vibration**

196. Depending upon the vibration characteristics, \_\_\_\_\_ may affect multiple body parts and organs.
- |                         |                        |
|-------------------------|------------------------|
| A. Surface residues     | D. Segmental vibration |
| B. Whole body vibration | E. Intensified noise   |
| C. Physical hazards     | F. None of the Above   |

197. Unlike whole body vibration, \_\_\_\_\_ appears to be more localized in creating injury to the fingers and hands of workers using tools which cause vibration.
- |                      |                               |
|----------------------|-------------------------------|
| A. Surface residue   | D. Segmental vibration        |
| B. A confined space  | E. A vibration characteristic |
| C. A physical hazard | F. None of the Above          |

**Other Hazards**

198. According to the text, some \_\_\_\_\_ cannot be eliminated because of the nature of the confined space or the work to be performed
- |                     |                        |
|---------------------|------------------------|
| A. Surface residues | D. Segmental vibration |
| B. Confined spaces  | E. Physical hazards    |
| C. Toxic gases      | F. None of the Above   |
199. The use of scaffolding in confined spaces has resulted in many accidents caused by workers or materials falling, \_\_\_\_\_, and lack of maintenance to insure worker safety.
- |                     |                                |
|---------------------|--------------------------------|
| A. Surface residues | D. Segmental vibration         |
| B. Confined spaces  | E. Improper use of guard rails |
| C. Physical hazards | F. None of the Above           |
200. The choice of scaffolding material depends upon the type of work to be performed, the calculated weight to be supported, and the surface on which the scaffolding is placed, as well as the substance previously stored in the confined space.
- A. True      B. False
201. \_\_\_\_\_ in confined spaces can increase already hazardous condition such as electrical shock, reaction of incompatible materials, liberation of toxic substances, and bodily injury due to slips and falls
- |                         |                              |
|-------------------------|------------------------------|
| A. Surface residues     | D. Segmental vibration       |
| B. Workers              | E. Vibration characteristics |
| C. Unauthorized workers | F. None of the Above         |
202. Baffles in horizontal tanks, trays in vertical towers, bends in tunnels, overhead structural members, or scaffolding installed for maintenance are examples of \_\_\_\_\_ within a confined space.
- |                     |                        |
|---------------------|------------------------|
| A. Surface residues | D. Segmental vibration |
| B. Confined spaces  | E. Structural hazards  |
| C. Toxic hazards    | F. None of the Above   |

**Abbreviations:**

203. The permissible exposure limit (PEL) is the \_\_\_\_\_ that must not be exceeded during an 8-hour work shift of a 40-hour workweek.
- |                         |                          |
|-------------------------|--------------------------|
| A. Number of work hours | D. Maximum limit         |
| B. Number of entries    | E. Average concentration |
| C. Number of employees  | F. None of the Above     |
204. The short-term exposure limit (STEL) is the 15-minute exposure limit that must not be exceeded during the \_\_\_\_\_:
- |                          |                      |
|--------------------------|----------------------|
| A. Confined space entry  | D. Workday           |
| B. Maximum concentration | E. Air monitoring    |
| C. Negative pressure     | F. None of the Above |



205. The recommended exposure limit (REL) is the \_\_\_\_\_ recommended for up to a 10-hour workday during a 40-hour workweek.
- |                         |                                |
|-------------------------|--------------------------------|
| A. Number of work hours | D. Maximum limit               |
| B. Number of entries    | E. Average concentration limit |
| C. Number of employees  | F. None of the Above           |
206. Immediately dangerous to life or health (IDLH) means the \_\_\_\_\_ from which a person could escape (in event of respiratory failure) without permanent or escape-impairing effects within 30 minutes.
- |                          |                             |
|--------------------------|-----------------------------|
| A. Confined space        | D. 15-minute exposure limit |
| B. Maximum concentration | E. Wearer's breathing zone  |
| C. Negative pressure     | F. None of the Above        |

## Respiratory Protection Chapter

### Types of Respirators

#### Commonly Used Respirators (Air Purifying)

207. \_\_\_\_\_ is a type of respirator worn over the nose and mouth to protect the respiratory system from certain nuisance dusts, mists, etc.
- |                           |                            |
|---------------------------|----------------------------|
| A. An Air-Line Respirator | D. A Disposable Dust Mask  |
| B. A Full-Face Respirator | E. Wearer's breathing zone |
| C. A Half-Face Respirator | F. None of the Above       |
208. Dust masks cannot be fit tested, are generally single use, are not recognized as proper respiratory protection, and may not be worn if a \_\_\_\_\_ exists.
- |                          |                               |
|--------------------------|-------------------------------|
| A. Proper respirator     | D. Potential for overexposure |
| B. Maximum concentration | E. Wearer's breathing zone    |
| C. Negative pressure     | F. None of the Above          |
209. \_\_\_\_\_ have interchangeable filter cartridges and can protect the respiratory system from hazardous dusts, fumes, mists, etc.
- |                          |                          |
|--------------------------|--------------------------|
| A. Air-Line Respirators  | D. Disposable Dust masks |
| B. Full-Face Respirators | E. Air masks             |
| C. Half-Face Respirators | F. None of the Above     |
210. Half-Face Respirators generally operate under negative pressure within the respirator which is created by the wearer's breathing through the filter cartridges. Protection is only gained if there is a proper seal of the \_\_\_\_\_.
- |                                  |                            |
|----------------------------------|----------------------------|
| A. Proper respiratory protection | D. Respirator face piece   |
| B. Mask                          | E. Wearer's breathing zone |
| C. Negative pressure             | F. None of the Above       |
211. \_\_\_\_\_ are similar to the half-face type, but they offer a better face piece fit and also protect the wearer's eyes from particularly irritating gases and vapors.
- |                          |                          |
|--------------------------|--------------------------|
| A. Air-Line Respirators  | D. Disposable Dust masks |
| B. Full-Face Respirators | E. Negative pressures    |
| C. Half-Face Respirators | F. None of the Above     |

212. Full-face, helmet or hood type powered air purifying respirators (PAPRs) operate under positive pressure inside the face piece. A battery operated motor blower assembly forces air through a filter cartridge into the \_\_\_\_\_.
- |                                  |                             |
|----------------------------------|-----------------------------|
| A. Proper respiratory protection | D. 15-minute exposure limit |
| B. Maximum concentration         | E. Wearer's breathing zone  |
| C. Negative pressure             | F. None of the Above        |

**Less Commonly Used Types Respirators (Air Supplying)**

213. \_\_\_\_\_ supply clean air to the wearer through a small diameter hose from a compressor or compressed air cylinders. Because the wearer must be attached to the hose at all times, mobility is limited.
- |                          |                          |
|--------------------------|--------------------------|
| A. Air-Line Respirators  | D. Disposable Dust masks |
| B. Full-Face Respirators | E. Attendants            |
| C. Half-Face Respirators | F. None of the Above     |
214. Self-Contained Breathing Apparatus (SCBA) respirators supply clean air from a compressed air tank carried on the wearer's back. SCBA respirators are highly mobile and are used primarily for \_\_\_\_\_.
- |                                  |                                      |
|----------------------------------|--------------------------------------|
| A. Proper respiratory protection | D. 15-minute exposure limit          |
| B. Maximum concentration         | E. Emergency response or rescue work |
| C. Negative pressure             | F. None of the Above                 |

**Respirator Filters/Cartridges**

215. The cartridges used for \_\_\_\_\_ must be either equipped with an end-of-service life indicator (ESLI) or a cartridge change schedule has to be established.
- |                          |                                 |
|--------------------------|---------------------------------|
| A. Air-Line Respirators  | D. Air-purifying respirators    |
| B. Full-Face Respirators | E. Average concentration limits |
| C. Half-Face Respirators | F. None of the Above            |
216. There are \_\_\_\_\_ of filters for protection against particulates.
- |                              |                      |
|------------------------------|----------------------|
| A. Proper protection classes | D. Nine classes      |
| B. No types                  | E. Many types        |
| C. Few types                 | F. None of the Above |

**Protection Factors**

217. The protection factor of a respirator is based on the ratio of two concentrations: the \_\_\_\_\_ outside the respirator to the contaminant concentration inside the respirator.
- |                              |                             |
|------------------------------|-----------------------------|
| A. Atmosphere                | D. Person's facial features |
| B. Contaminant concentration | E. Oxygen deficiency        |
| C. Oxygen level              | F. None of the Above        |
218. Each class of respirator also has an assigned protection factor (APF).
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|
219. When a \_\_\_\_\_ outside the respirator is known, the APF can be used to estimate the concentration inside a particular type of respirator worn by the user.
- |                         |                              |
|-------------------------|------------------------------|
| A. Hazardous atmosphere | D. Hazard                    |
| B. Low oxygen level     | E. Contaminant concentration |
| C. Toxic gas            | F. None of the Above         |

### Who Cannot Wear a Respirator?

220. Respirators cannot be worn when a person wears \_\_\_\_\_ that interferes with the seal of the face piece.
- A. Clothing
  - B. Jewelry
  - C. Other equipment
  - D. A headphone set
  - E. Glasses or personal protective equipment
  - F. None of the Above
221. Respirators cannot be worn when a person has \_\_\_\_\_ that comes between the sealing surface of the face piece and the face or interferes with valve function.
- A. Clothing
  - B. Jewelry
  - C. Other equipment
  - D. Facial hair
  - E. A damaged face piece
  - F. None of the Above
222. Respirators cannot be worn when a person has a breathing problem, a heart condition, or is \_\_\_\_\_.
- A. Unauthorized
  - B. Heat sensitive
  - C. Sick
  - D. Dizzy
  - E. Unstable on their feet
  - F. None of the Above

### Checking for Damage

223. A respirator must be inspected before each use to make sure there are no holes, tears, etc., in the respirator.
- A. True
  - B. False

### Staying Prepared for Respirator Use

224. Getting used to respirators takes practice. Possible problems with wearing respirators may include heat exhaustion or heat stroke.
- A. True
  - B. False

### Using up the air supply

225. When using a \_\_\_\_\_, keep checking the gauges and listening for alarms. Be ready to leave the area immediately if there is a problem.
- A. Respirator
  - B. SCBA
  - C. Dust mask
  - D. Half-Face Respirator
  - E. Full-Face Respirator
  - F. None of the Above

### Panic

226. \_\_\_\_\_ is important when working in a hot, stressful, or awkward situation.
- A. A respirator
  - B. SCBA
  - C. Staying calm
  - D. Following procedures
  - E. Air monitoring
  - F. None of the Above

### Cleaning Respirators

227. Respirators should be cleaned and disinfected once a year. Check the respirator for damage before wearing it.
- A. True
  - B. False

228. Respirators stored for emergency use must be inspected \_\_\_\_\_ when not in use, and also after each use.
- A. Monthly
  - B. Weekly
  - C. Annually
  - D. Bi-monthly
  - E. Semi-annually
  - F. None of the Above

### Operating Procedures

229. \_\_\_\_\_ must be accurate and must be written in easily understood language. Technical jargon should be avoided. Translations must be supplied if necessary.
- A. Permits
  - B. Contractor's performance review
  - C. Safety rules
  - D. Work orders
  - E. Operating procedures
  - F. None of the Above
230. Operating procedures must include operating steps for initial startup, normal and temporary operations, emergency shutdown, \_\_\_\_\_, normal shutdown, and startup after a turnaround or an emergency shutdown.
- A. Documenting work
  - B. Safety performance
  - C. Process safety training
  - D. Gas and vapor detection
  - E. Emergency operations
  - F. None of the Above
231. Operating procedures must include \_\_\_\_\_, including what happens if workers don't conform to operating limits and how to avoid or correct such problems.
- A. Permits
  - B. Contractor's performance review
  - C. Safety rules
  - D. Work orders
  - E. Operating limits
  - F. None of the Above
232. Operating procedures must include safety and health considerations, such as chemical hazards, precautions to prevent exposure, \_\_\_\_\_ for chemicals, and actions to be taken if an employee is exposed to a hazardous substance.
- A. Quality and inventory control
  - B. Safety performance
  - C. Safety training
  - D. Gas and vapor contaminants
  - E. Respiratory protection program
  - F. None of the Above
233. Operating procedures must include \_\_\_\_\_ and their functions, including up-to-date operating procedures and safe work practices.
- A. Safe work practices
  - B. Contractor's duties
  - C. Safety rules
  - D. Safety systems
  - E. Potential hazards
  - F. None of the Above

### Contractor Employees

234. According to the text, process safety training and \_\_\_\_\_ are also required for contractors who work on-site.
- A. Logs
  - B. Safety performance
  - C. Safety programs
  - D. Work orders
  - E. A respiratory protection program
  - F. None of the Above

235. Managers must check out the \_\_\_\_\_ of any contractors that may be hired for maintenance, repair, turnaround, major renovation, or specialty work on or around a process covered by the OSHA regulation.
- A. Logs
  - B. Safety performance and programs
  - C. Reputation
  - D. Work orders
  - E. Respiratory protection program
  - F. None of the Above
236. To further ensure contractor safety, managers must also provide the contractor with information on \_\_\_\_\_ for the process they're involved with and tell them what actions are to be taken in an emergency.
- A. Safe work practices
  - B. Performance standards
  - C. Project schedules
  - D. Respirators
  - E. Time limits
  - F. None of the Above
237. To further ensure contractor safety, managers must also keep a log of \_\_\_\_\_ related to their work in process areas.
- A. Contractor employees' injuries or illnesses
  - B. Safety performance
  - C. Required training
  - D. Gas and vapor contaminants
  - E. Respirators
  - F. None of the Above
238. To further ensure contractor safety, managers must also evaluate the \_\_\_\_\_ to make sure they're living up to their safety obligations set by the OSHA standard,
- A. Work progress
  - B. Contractor's performance
  - C. Required training
  - D. Work schedules
  - E. Potential hazards
  - F. None of the Above

**The Contractor has Responsibilities, too**

239. The Contractor must document that employees are trained to \_\_\_\_\_ and to follow safe work practices on the job.
- A. Recognize hazards
  - B. Work efficiently
  - C. Work quickly
  - D. Follow orders
  - E. Complete the job
  - F. None of the Above
240. Contractors must make sure that their employees understand \_\_\_\_\_, are trained to work safely, and follow the safety rules of the facility in which they're working.
- A. Time schedules
  - B. Potential job-related hazards
  - C. Performance standards
  - D. The scope of the work
  - E. Confined spaces
  - F. None of the Above

**Written Respiratory Protection Program**

241. The employer is required to develop and implement a written respiratory protection program with \_\_\_\_\_ and elements for required respirator use.
- A. Required worksite-specific procedures
  - B. Safety performance
  - C. Process safety training
  - D. Gas and vapor contaminant limits
  - E. Performance standards
  - F. None of the Above

242. The respirator protection program must be administered by \_\_\_\_\_.
- A. Attendants
  - B. Entrants
  - C. A suitably trained program administrator
  - D. Rescue workers
  - E. Contractors
  - F. None of the Above

### Gas and Vapor Contaminants

243. According to the text, gas and vapor contaminants can be classified according to their \_\_\_\_\_.
- A. Chemical characteristics
  - B. Hazard risk
  - C. Likelihood of occurrence
  - D. Toxic level
  - E. Respiratory protection program
  - F. None of the Above

244. Substances that are liquids or solids at room temperature form \_\_\_\_\_ when they evaporate.
- A. Chemical reactions
  - B. New substances
  - C. Vapors
  - D. Risks
  - E. Hazards
  - F. None of the Above

245. Inert gases such as helium, argon, neon, etc. do not metabolize in the body, but they represent a hazard because they can produce an oxygen deficiency by displacement of air.
- A. True
  - B. False

246. Acidic gases such as sulfur dioxide, hydrogen sulfide and hydrogen chloride exist as \_\_\_\_\_ or produce acids by reaction with water. They are often highly toxic.
- A. Metals attached to organic groups
  - B. Pollutants
  - C. Natural components of atmosphere
  - D. Inert gases
  - E. Acids
  - F. None of the Above

247. Alkaline gases such as ammonia and phosphine exist as alkalis or \_\_\_\_\_.
- A. Metals attached to organic groups
  - B. Pollutants
  - C. Natural components of atmosphere
  - D. Inert gases
  - E. Produce alkalis by reaction with water
  - F. None of the Above

248. Vaporous contaminants classified as organic compounds can exist as true gases or vapors produced from organic liquids. Gasoline, solvents and paint thinners are examples.
- A. True
  - B. False

249. Vaporous contaminants classified as organometallic compounds are generally comprised of \_\_\_\_\_. Tetraethyllead and organic phosphates are examples.
- A. Metals attached to organic groups
  - B. Pollutants
  - C. Acids
  - D. Inert gases
  - E. Alkalis
  - F. None of the Above

### Hazard Assessment

250. The first important step to protection is \_\_\_\_\_.
- A. Research
  - B. An atmosphere's oxygen content
  - C. Breathing zone samples
  - D. Ventilation
  - E. Proper assessment of the hazard
  - F. None of the Above

251. Air samples must be taken with proper sampling instruments during all conditions of operation to determine an atmosphere's oxygen content or \_\_\_\_\_ and/or gaseous contaminants.
- |  |                                      |
|--|--------------------------------------|
| A. Respirator requirements             | D. Deficiency by displacement of air |
| B. Concentration levels of particulate | E. Pollutant levels                  |
| C. Humidity level                      | F. None of the Above                 |
252. Breathing zone sampling frequency should be sufficient to assess the \_\_\_\_\_ under the variable operating and exposure conditions.
- |                                |                                      |
|--------------------------------|--------------------------------------|
| A. Respirator requirements     | D. Deficiency by displacement of air |
| B. Atmosphere's oxygen content | E. Pollutant levels                  |
| C. Average exposure            | F. None of the Above                 |

**Excavation and Trenching Chapter**  
**OSHA SUBPART P - 29 CFR 1926.650-652**  
**COMPETENT PERSON TRAINING**  
**PREFACE**

253. According to the text, the \_\_\_\_\_ was revised because excavating is the most dangerous of all construction operations.
- |                             |                                  |
|-----------------------------|----------------------------------|
| A. Competent rule           | D. Protective equipment standard |
| B. OSHA excavation standard | E. Emergency rule                |
| C. Inspection rule          | F. None of the Above             |
254. OSHA also revised the \_\_\_\_\_ to clarify the requirements.
- |                      |                                  |
|----------------------|----------------------------------|
| A. Competent rule    | D. Protective equipment standard |
| B. Existing standard | E. Emergency contact methods     |
| C. Inspection rule   | F. None of the Above             |
255. The performance criteria in the new standard provides employers with options when classifying soil and when selecting methods to protect the \_\_\_\_\_ from cave-ins.
- |                     |                           |
|---------------------|---------------------------|
| A. Competent person | D. Construction equipment |
| B. Employee         | E. Emergency personnel    |
| C. Inspectors       | F. None of the Above      |
256. Although employers have options when meeting some of the requirements, \_\_\_\_\_ must realize that the employee must be protected at all times.
- |                      |                      |
|----------------------|----------------------|
| A. Competent persons | D. Contractors       |
| B. Rescue personnel  | E. Employers         |
| C. Inspectors        | F. None of the Above |
257. Professional engineers will be required in some situations to plan or design the excavation and/or method of protecting the worker.
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|

### Competent Person

258. Competent person means one who is capable of identifying existing hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees. The \_\_\_\_\_ has authorization to take prompt corrective measures to eliminate identified hazards.
- A. Competent person
  - B. Contractor
  - C. Construction inspector
  - D. Watchman
  - E. Engineer
  - F. None of the Above
259. A \_\_\_\_\_ must have specific training in and be knowledgeable about soils analysis, the use of protective systems and the requirements of 29 CFR Part 1926.650-652 Subpart P.
- A. Competent person
  - B. Contractor
  - C. Construction inspector
  - D. Watchman
  - E. Supervisor
  - F. None of the Above
260. Everyone is required to practice \_\_\_\_\_ one a year.
- A. Competent person training
  - B. Rescue training exercises
  - C. Inspections
  - D. Protective equipment use
  - E. Emergency procedures
  - F. None of the Above

### Competent Person Duties

261. The competent person performs daily inspections of the protective equipment, \_\_\_\_\_, safety equipment, and adjacent areas.
- A. Work progress
  - B. Construction Crew
  - C. Jobsite
  - D. Trench conditions
  - E. Work quality
  - F. None of the Above
262. The competent person shall make \_\_\_\_\_ prior to the start of work and as needed throughout the shift.
- A. Personnel assignments
  - B. Training available
  - C. Inspections
  - D. Protective equipment available
  - E. Emergency contacts
  - F. None of the Above
263. The competent person shall make \_\_\_\_\_ after every rainstorm or other hazard occurrence.
- A. Personnel assignments
  - B. Training available
  - C. Inspections
  - D. Protective equipment available
  - E. Emergency contacts
  - F. None of the Above
264. The competent person must have knowledge of \_\_\_\_\_, telephone or radio dispatch.
- A. Personnel assignments
  - B. Work schedules
  - C. Inspections
  - D. Protective equipment
  - E. Emergency contact methods
  - F. None of the Above
265. The competent person removes employees and \_\_\_\_\_ from hazardous conditions and makes all changes necessary to ensure their safety.
- A. Competent persons
  - B. All other personnel
  - C. Inspectors
  - D. Protective equipment
  - E. Unauthorized personnel
  - F. None of the Above



266. The competent person makes sure that all \_\_\_\_\_ have proper protective equipment, hard-hats, reflective vests, steel-toed boots, harnesses, eye protection, hearing protection and drinking water.
- A. Competent persons
  - B. Contractors
  - C. Inspectors
  - D. Employees
  - E. Unauthorized personnel
  - F. None of the Above

### Scope of Work

267. According to the text, during excavation work a competent person shall be on the job site at all times when personnel are working within or around the \_\_\_\_\_.
- A. Competent person
  - B. Contractors
  - C. Inspectors
  - D. Ladders
  - E. Excavation
  - F. None of the Above
268. Prior to opening an excavation, the estimated locations of \_\_\_\_\_ that reasonably may be expected to be encountered during excavation work shall be determined.
- A. Unauthorized persons
  - B. Employees
  - C. Inspectors
  - D. Underground utility installations
  - E. Other excavation work
  - F. None of the Above
269. \_\_\_\_\_ shall be taken to protect employees against the hazards posed by water accumulation in the excavation.
- A. Additional care
  - B. Adequate precautions
  - C. Photographs
  - D. Ladders
  - E. Permits
  - F. None of the Above
270. According to the text, employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations.
- A. True
  - B. False
271. In trench excavations that are four (4') feet or more in depth, a stairway, ladder, or ramp shall be used as a \_\_\_\_\_.
- A. Tool
  - B. Means of access or egress
  - C. Barrier
  - D. Bridge
  - E. Warning sign
  - F. None of the Above
272. The Ladder(s), stairway(s), or ramp shall be spaced so that no employee in the trench excavation is more than fifty (50') feet from a means of egress.
- A. True
  - B. False
273. When excavations are made in vehicular traffic areas, \_\_\_\_\_ shall wear a warning vest made with reflective material or highly visibility material.
- A. Competent persons
  - B. Each employee
  - C. Inspectors
  - D. Rescue personnel
  - E. Equipment Operators
  - F. None of the Above

274. Employees shall be required to stand away from any vehicle during loading or unloading to avoid being struck by \_\_\_\_\_.
- |                                      |                       |
|--------------------------------------|-----------------------|
| A. Vehicles                          | D. Ladders            |
| B. Any spillage or falling materials | E. Careless operation |
| C. Equipment                         | F. None of the Above  |
275. The air shall be tested in excavations where \_\_\_\_\_ exist, or could be reasonably expected to exist.
- |                         |  |
|-------------------------|--|
| A. Limited visibilities | D. Narrow trench walls                     |
| B. Employees            | E. Oxygen deficiency or gaseous conditions |
| C. Flooding hazards     | F. None of the Above                       |
276. When the atmosphere contains less than 19.5 percent oxygen, the area must be continuously ventilated until the \_\_\_\_\_.
- |                              |   |
|------------------------------|---|
| A. Excavation is closed      | D. Oxygen levels are above 19.5 percent |
| B. Employees enter the space | E. Ladders are placed                   |
| C. Work begins               | F. None of the Above                    |
277. Where a \_\_\_\_\_, the area shall be ventilated until the flammable gas concentration is below 20 percent of the LFL (lower flammable limit).
- |   |                                |
|---|--------------------------------|
| A. Competent person requires monitoring | D. Deficiency of oxygen exists |
| B. Gaseous condition exists             | E. Worker encounters fumes     |
| C. Trench is excavated                  | F. None of the Above           |
278. Whenever \_\_\_\_\_ exist or could reasonably exist, the air must be monitored continuously to assure that workers are protected.
- |  |                      |
|--|----------------------|
| A. Traffic conditions                      | D. Low visibilities  |
| B. Oxygen deficiency or gaseous conditions | E. Excavations       |
| C. Flooding conditions                     | F. None of the Above |
279. Where the stability of adjoining buildings, walls or other structures are \_\_\_\_\_, shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.
- |  |  |
|--|--|
| A. Not a concern                       | D. Noticed                             |
| B. Endangered by excavation operations | E. Not mentioned in the specifications |
| C. Encountered                         | F. None of the Above                   |
280. In situations where sidewalks, pavement and appurtenant structures may be undermined, a support system such as shoring must be provided to protect \_\_\_\_\_ from the possible collapse of such structures.
- |                         |                      |
|-------------------------|----------------------|
| A. Unauthorized persons | D. Vehicles          |
| B. Employees            | E. Excavations       |
| C. Equipment            | F. None of the Above |

### Personnel Protective Systems

281. According to the text, employees in \_\_\_\_\_ shall be protected from cave-ins by an adequate protective system, which shall be inspected by a competent person.
- |                |                       |
|----------------|-----------------------|
| A. Excavations | D. Protective systems |
| B. Vehicles    | E. Cave-ins           |
| C. Training    | F. None of the Above  |

282. The use of \_\_\_\_\_ is required for all excavations deeper than five (5') feet, except when excavation is within stable rock.
- |                                 |                       |
|---------------------------------|-----------------------|
| A. Tables                       | D. Protective systems |
| B. Tabulated data               | E. Air monitoring     |
| C. Proper excavation techniques | F. None of the Above  |
283. For trench excavations less than five (5') feet deep, the use of \_\_\_\_\_ may not be required unless there is evidence of a potential cave-in. The competent person shall make this determination.
- |                   |                       |
|-------------------|-----------------------|
| A. Ladders        | D. Protective systems |
| B. Tabulated data | E. Ramps              |
| C. Air monitors   | F. None of the Above  |
284. Requirements for sloping, benching or protective systems are found in \_\_\_\_\_.
- |                       |   |
|-----------------------|---|
| A. Safety Manuals     | D. Company policies                           |
| B. Tabulated data     | E. CFR 1926.652 (OSHA Construction Standards) |
| C. Trench excavations | F. None of the Above                          |
285. Whenever support systems, \_\_\_\_\_, or other protective systems are being used, a written copy of the manufacturer's specifications, recommendations, and limitations sheet shall be available at the job site.
- |                   |                      |
|-------------------|----------------------|
| A. Shield systems | D. Ladders           |
| B. Tabulated data | E. Ramps             |
| C. Air monitors   | F. None of the Above |

### Excavation Protection Systems

286. There are three basic protective systems for excavations and trenches. They are sloping and benching systems, \_\_\_\_\_, and shields.
- |               |                      |
|---------------|----------------------|
| A. Ladders    | D. Attendants        |
| B. Ramps      | E. Shoring           |
| C. Barricades | F. None of the Above |
287. Every employee in an excavation or trench shall be protected from \_\_\_\_\_ by an adequate protective system.
- |                         |                      |
|-------------------------|----------------------|
| A. Unauthorized persons | D. Polluted air      |
| B. Vehicles             | E. Cave-ins          |
| C. Flooding             | F. None of the Above |

### Sloping and Benching Systems

288. An option for sloping is to slope to the angle required by OSHA Construction Standards for Type C, which is the most \_\_\_\_\_.
- |                                      |                      |
|--------------------------------------|----------------------|
| A. Unstable soil type                | D. Porous soil type  |
| B. Stable soil type                  | E. Sandy soil type   |
| C. Frequently encountered soil type. | F. None of the Above |
289. Another option for sloping is to first determine the soil type, then use the table provided in Appendix B of the standard to determine the \_\_\_\_\_.
- |                            |                                 |
|----------------------------|---------------------------------|
| A. Maximum allowable angle | D. Protective system to be used |
| B. Porosity                | E. Soil density                 |
| C. Moisture content        | F. None of the Above            |

290. Another option for sloping is to utilize \_\_\_\_\_ prepared by a registered professional engineer.
- |                   |                       |
|-------------------|-----------------------|
| A. Instructions   | D. Protective systems |
| B. Tabulated data | E. Opinions           |
| C. Standards      | F. None of the Above  |
291. According to the text, a registered professional engineer can design a \_\_\_\_\_ for a specific job.
- |                      |                      |
|----------------------|----------------------|
| A. Table             | D. Protective system |
| B. Sloping plan      | E. Rescue plan       |
| C. Trench excavation | F. None of the Above |
292. \_\_\_\_\_ for excavations five (5) to twenty (20) feet in depth must be constructed in accordance with the instructions of a designated competent person.
- |                                 |                                 |
|---------------------------------|---------------------------------|
| A. Sloping and benching systems | D. Air ventilation systems      |
| B. Tabulated data               | E. Ground water pumping systems |
| C. Trench excavation limits     | F. None of the Above            |
293. A registered professional engineer must design and stamp the sloping and benching systems for excavations \_\_\_\_\_.
- |                                       |                                  |
|---------------------------------------|----------------------------------|
| A. Greater than twenty (20) feet deep | D. To be made by contractors     |
| B. In traffic areas                   | E. That have previously caved-in |
| C. Adjacent to structures             | F. None of the Above             |

### Shoring Systems

294. \_\_\_\_\_ is another protective system that utilizes a framework of vertical members, horizontal members, and cross braces to support the sides of the excavation to prevent a cave-in.
- |                             |                      |
|-----------------------------|----------------------|
| A. Shoring                  | D. Cross bracing     |
| B. Tabulated data           | E. Lateral support   |
| C. Proper trench excavation | F. None of the Above |

### Shield Systems (Trench Boxes)

295. Shielding is the third method of providing a safe workplace in excavations. Unlike sloping and shoring, \_\_\_\_\_ does not prevent a cave-in.
- |                      |                      |
|----------------------|----------------------|
| A. Shielding         | D. Soil testing      |
| B. Tabulated data    | E. Soil sampling     |
| C. Trench excavation | F. None of the Above |
296. Shields are designed to \_\_\_\_\_, thereby protecting the employees working inside the structure.
- |  |                       |
|--|-----------------------|
| A. Withstand the soil forces caused by a cave-in | D. Bend but not break |
| B. Keep water out of the excavation              | E. Prevent cave-ins   |
| C. Be a traffic barrier                          | F. None of the Above  |
297. Design and construction of \_\_\_\_\_ is not covered in the OSHA Standards.
- |                                 |                       |
|---------------------------------|-----------------------|
| A. Sloping and benching systems | D. Protective systems |
| B. Tabulated data               | E. Shielding          |
| C. Trench excavation            | F. None of the Above  |

### Safety Precautions for Shield Systems

298. There must not be any lateral movement of \_\_\_\_\_ when installed.
- A. Sloping and benching systems
  - B. Tabulated data
  - C. Equipment
  - D. Ladders
  - E. Shields
  - F. None of the Above
299. To protect employees from cave-ins when entering and exiting the shield, a ladder within the \_\_\_\_\_ or a properly sloped ramp at the end shall be provided.
- A. Sloping and benching systems
  - B. Jobsite
  - C. Vicinity of the excavation
  - D. Tabulated data
  - E. Shield
  - F. None of the Above
300. According to the text, employees are not allowed in the \_\_\_\_\_ during installation, removal, or during any vertical movement.
- A. Sloping and benching systems
  - B. Shield
  - C. Trench excavation
  - D. Vicinity of the excavation
  - E. Cave-ins
  - F. None of the Above
301. Shields can be installed 2 ft. above the bottom of an excavation, provided that they are designed to \_\_\_\_\_.
- A. Tabulated data
  - B. Resist loads at the full depth
  - C. OSHA standards
  - D. Be easily removed
  - E. Prevent cave-ins
  - F. None of the Above
302. The \_\_\_\_\_ must extend at least 18 inches above the point where proper sloping of the excavation begins.
- A. Sloping and benching systems
  - B. Shield
  - C. Trench excavation
  - D. Protective systems
  - E. Cave-ins
  - F. None of the Above
303. The exposed excavation wall at the \_\_\_\_\_ must be sloped, shored, or shielded.
- A. Excavation site
  - B. Open end of the shield
  - C. Trench excavation
  - D. Jobsite
  - E. Traffic side of the excavation
  - F. None of the Above

### Personal Protective Equipment

304. \_\_\_\_\_ requires that employees wear a hard hat, safety glasses, and work boots on the jobsite.
- A. The contractor
  - B. OSHA policy
  - C. Recommended practice
  - D. The construction inspector
  - E. Common sense
  - F. None of the Above

### Excavation & Trenching Guidelines

305. Procedures and guidelines for the protection of employees working in and around excavations and trenches must be in compliance with OSHA Standards described in Subpart P (CFR 1926.650) for the construction industry.
- A. True
  - B. False

306. According to the text, the competent person(s) must be trained in accordance with the OSHA Excavation Standard, and all other programs that may apply, and must demonstrate a thorough understanding and knowledge of the programs and the hazards associated.  
 A. True                      B. False
307. All other employees working in and around the excavation must be trained to recognize the hazards associated with \_\_\_\_\_.  
 A. OSHA Standards                      D. Adequate protection systems  
 B. Trenching and excavating                      E. Personal protective equipment  
 C. Confined spaces                      F. None of the Above

**Hazard Controls**

308. Knowing the location of underground installations is a good idea because it could make the work go faster.  
 A. True                      B. False
309. All overhead hazards (surface encumbrances) must be removed or supported to \_\_\_\_\_.  
 A. Meet OSHA Standards                      D. Reduce shock hazards  
 B. Make trenching and excavating easier                      E. Prevent collapse  
 C. Eliminate the hazard                      F. None of the Above
310. If \_\_\_\_\_ will be over 20 feet deep, it must be designed by a registered professional engineer.  
 A. A ladder                      D. Construction equipment  
 B. A means of access or egress                      E. Personal protective equipment  
 C. An excavation                      F. None of the Above
311. \_\_\_\_\_, such as sloping, shoring, or shielding, will be utilized to protect employees.  
 A. Adequate protective systems                      D. Soil testing  
 B. Soil classifications                      E. Personal protective equipment  
 C. Recommended practices                      F. None of the Above
312. An excavation safety plan must be developed to protect employees.  
 A. True                      B. False
313. Workers must be supplied with, and wear, any \_\_\_\_\_ deemed necessary to protect them while working in excavations.  
 A. Uniforms                      D. Tools  
 B. Apparel                      E. Personal protective equipment  
 C. Gear                      F. None of the Above
314. All \_\_\_\_\_ must be stored at least two (2) feet from the sides of the excavation. The spoil pile must not block the safe means of egress.  
 A. Safety plans                      D. Spoil piles  
 B. Barricades                      E. Means of egress  
 C. Protective systems                      F. None of the Above

315. If a trench or excavation is 4 feet or deeper, stairways, ramps, or ladders must be provided as a safe means of access and egress. Employees working in trenches must not have to travel any more than 25 feet laterally to reach a \_\_\_\_\_.
- |                              |                      |
|------------------------------|----------------------|
| A. Stairway, ramp, or ladder | D. Benched area      |
| B. Safe area                 | E. Hardhat           |
| C. Competent person          | F. None of the Above |
316. No employee will be permitted to work in an excavation where \_\_\_\_\_ is accumulating unless adequate protection measures are used to protect the employees.
- |                         |                      |
|-------------------------|----------------------|
| A. Construction debris  | D. Spoil             |
| B. Trash                | E. Water             |
| C. Protective equipment | F. None of the Above |
317. All excavations and trenches must be inspected daily by a \_\_\_\_\_, prior to employee exposure or entry. Trenches and excavations will also be inspected after any rainfall, soil change, or any other time needed during the shift.
- |                          |                      |
|--------------------------|----------------------|
| A. Professional engineer | D. Contractor        |
| B. Supervisor            | E. Worker            |
| C. Competent person      | F. None of the Above |
318. When excavations and trenches 4 feet or deeper have the potential for toxic substances or \_\_\_\_\_, the air will be tested at least daily.
- |                         |                          |
|-------------------------|--------------------------|
| A. Cave-ins             | D. Hazardous atmospheres |
| B. Unauthorized workers | E. Poor means of egress  |
| C. Flooding             | F. None of the Above     |
319. If work is in or around traffic, \_\_\_\_\_ must be utilized to ensure the safety of employees, vehicular traffic, and pedestrians.
- |                         |                                  |
|-------------------------|----------------------------------|
| A. Signs and barricades | D. Additional personnel          |
| B. Soil classifications | E. Personal protective equipment |
| C. Competent persons    | F. None of the Above             |

**Excavation Safety Plan**

320. A written excavation safety plan is required. This plan is to be developed to the level necessary to ensure complete compliance with the \_\_\_\_\_ and state and local safety standards.
- |   |  |
|---|--|
| A. Professional engineer's requirements | D. Simplified Soil Classification System |
| B. Company safety manual                | E. OSHA Excavation Safety Standard       |
| C. Protective systems                   | F. None of the Above                     |

**Soil Classification and Identification**

321. The Simplified Soil Classification System defined by OSHA Standards consists of four categories: \_\_\_\_\_, Type A, Type B, and Type C.
- |           |                      |
|-----------|----------------------|
| A. Type Z | D. Stiff clay        |
| B. Gravel | E. Stable rock       |
| C. Sand   | F. None of the Above |

322. Type A soils are \_\_\_\_\_ with an unconfined compressive strength of 1.5 tons per square foot (TSF) or greater.
- |                     |                      |
|---------------------|----------------------|
| A. The least stable | D. Field tested      |
| B. Sandy            | E. Cohesive soils    |
| C. Porous           | F. None of the Above |
323. Examples of Type A soils are \_\_\_\_\_ like caliche and hardpan.
- |                           |                      |
|---------------------------|----------------------|
| A. Cemented soils         | D. Uncommon soils    |
| B. Soil classifications   | E. Hazardous         |
| C. The least stable soils | F. None of the Above |

**Soil Test & Identification**

324. The competent person will classify the \_\_\_\_\_ according to the definitions in Appendix A of the OSHA standard based on at least one visual and one manual analysis.
- |                   |                      |
|-------------------|----------------------|
| A. Shields        | D. Work quality      |
| B. Soil type      | E. Hazards           |
| C. Cohesion tests | F. None of the Above |
325. Soil classification tests should be run on freshly excavated samples from the excavation and are designed to determine soil stability based on a number of criteria.
- |         |          |
|---------|----------|
| A. True | B. False |
|---------|----------|
326. Clay, silt, and sand are \_\_\_\_\_. Clay particles are the smallest, silt particles are intermediate, and sand particles are the largest.
- |                   |                         |
|-------------------|-------------------------|
| A. Very cohesive  | D. Hazardous            |
| B. Corrosive      | E. Size classifications |
| C. Highly elastic | F. None of the Above    |
327. The degree of \_\_\_\_\_ and plasticity of a soil depend on the amounts of clay, silt, sand, and water present.
- |                   |                      |
|-------------------|----------------------|
| A. Compatibility  | D. Durability        |
| B. Corrosiveness  | E. Cohesiveness      |
| C. Cohesion tests | F. None of the Above |
328. The soil in an excavation is subject to change several times within the scope of a project and the \_\_\_\_\_ will vary with weather and job conditions.
- |                   |                      |
|-------------------|----------------------|
| A. Shields        | D. Moisture content  |
| B. Shoring        | E. Competent person  |
| C. Cohesion tests | F. None of the Above |
329. According to the text, the competent person must also determine the level of protection based on what conditions exist at the time of the test, and \_\_\_\_\_.
- |                                  |                          |
|----------------------------------|--------------------------|
| A. Available equipment           | D. Recommended practices |
| B. Tabulated data                | E. Cohesion tests        |
| C. Allow for changing conditions | F. None of the Above     |



## Shielding

330. Shielding does not prevent cave-ins. Instead, it protects the workers in the event of a cave-in.  
A. True                      B. False
331. When placed in an excavation, shields have sufficient structural strength to support the \_\_\_\_\_, thereby protecting the employees in the trench.  
A. Nearby structures                      D. Means of access or egress  
B. Construction vehicles                      E. Force of a cave-in should one occur  
C. Excavating equipment                      F. None of the Above
332. Most \_\_\_\_\_ have two flat, parallel metal walls that are held apart by metal cross braces that are placed at the ends of the "box." This allows for the installation of pipe within the interior dimensions of the shield.  
A. Shields                      D. Shoring systems  
B. Reputable manufacturers                      E. Open ends of the shield  
C. Trenches                      F. None of the Above
333. An operation where a contractor excavates just enough trench to install the shield, then sets a joint of pipe, then excavates further, then pulls the shield forward to install another joint while the first is being backfilled, is known as "\_\_\_\_\_".  
A. Shielding                      D. Standard practice  
B. Opening the shield                      E. Cut and cover  
C. Dragging the box                      F. None of the Above
334. \_\_\_\_\_ have become more popular with public works maintenance crews and contractors working in shallow excavations because of their ease of use.  
A. Smaller shields                      D. Open-ended shields  
B. Reputable manufacturers                      E. Sloping and benching methods  
C. Cohesion tests                      F. None of the Above
335. Round shields made of \_\_\_\_\_ have recently appeared.  
A. Approved materials                      D. Surplus materials  
B. Wood                      E. High-strength plastic  
C. Corrugated metal                      F. None of the Above
336. Since shield construction is not covered by OSHA Standards, it is critical that you know your \_\_\_\_\_.  
A. Local welder                      D. Competent person  
B. Safety manual                      E. Equipment operators  
C. Supplier                      F. None of the Above
337. \_\_\_\_\_ supply boxes designed by registered professional engineers and certified for their applications.  
A. Contractors                      D. Local welders  
B. Reputable manufacturers                      E. Competent persons  
C. Company storerooms                      F. None of the Above

338. Any bent or deformed structural member of a shield system must be repaired or replaced according to the manufacturer's guidelines.  
 A. True            B. False
339. Any modification to the shields must be \_\_\_\_\_.  
 A. Reported to the competent person    D. Approved by the manufacturer  
 B. Noted in the excavation log            E. Approved by the supervisor  
 C. Made by an approved welder          F. None of the Above
340. Shields in trenches must be installed so as to prevent \_\_\_\_\_ in the event of a cave-in  
 A. Lateral movement                        D. Hazards to pedestrians  
 B. Damage to equipment                    E. Undermining of the surrounding area  
 C. Cohesion tests                            F. None of the Above
341. According to the text, shields may ride two feet above the bottom of an excavation, provided they are calculated to support the full depth of the excavation and there is no \_\_\_\_\_ under or behind the shield.  
 A. Pipe    D. Caving  
 B. Material                                      E. Equipment  
 C. Spoil    F. None of the Above
342. Workers must be protected when entering or leaving the shield by using a \_\_\_\_\_ within the shield or a properly sloped ramp at the end.  
 A. Shield    D. Rope  
 B. Ladder                                        E. Hoist  
 C. Support                                        F. None of the Above
343. Workers must exit the shield during its installation, removal, or \_\_\_\_\_.  
 A. Inclement weather                        D. At dusk  
 B. Daily inspection                            E. During vertical movement  
 C. Soil testing                                    F. None of the Above
344. The excavation wall at the \_\_\_\_\_ should be sloped, shored or shielded off to prevent a cave-in from the end.  
 A. Side of the shield                            D. Traffic side  
 B. End of the job                                E. Construction site  
 C. Open end of the shield                    F. None of the Above
345. If the excavation will be deeper than the \_\_\_\_\_, attached shields of the correct specifications may be used. As an alternate, the excavation may be sloped back to the maximum allowable angle from a point 18 inches below the top of the shield.  
 A. Planned depth                                D. Competent person allows  
 B. Shield is tall                                 E. Workers feel safe  
 C. Designed depth                              F. None of the Above

## Inspections

346. The excavations, adjacent areas, and protective systems shall be inspected daily by the \_\_\_\_\_.
- A. Contractor
  - B. Employees
  - C. OSHA Compliance Officer
  - D. Competent person
  - E. Supervisor
  - F. None of the Above
347. During inspections, the competent person shall look for evidence of a situation that could result in a cave-in, indications of \_\_\_\_\_, hazardous atmospheres or other hazardous conditions.
- A. Failure of protective systems
  - B. Poor workmanship
  - C. OSHA compliance
  - D. Missing tools
  - E. Too many workers
  - F. None of the Above
348. All \_\_\_\_\_ shall be conducted by the competent person prior to the start of work, as needed throughout the shift, and after every rainstorm or other increasing hazard.
- A. Inspections
  - B. Writing of excavation reports
  - C. OSHA compliance inspections
  - D. Excavation training
  - E. Worker evaluations
  - F. None of the Above

## Handling an OSHA Inspection

349. Project managers, foremen, and competent persons sometimes feel intimidated when \_\_\_\_\_ visits a job sit.
- A. A company CEO
  - B. A professional engineer
  - C. The town mayor
  - D. An OSHA compliance officer
  - E. A news reporter
  - F. None of the Above
350. In order to avoid feeling intimidated, companies should have a policy and a plan of action for managers to follow when handling \_\_\_\_\_.
- A. Contractors
  - B. Unauthorized persons
  - C. An OSHA inspection
  - D. Suppliers
  - E. Workers
  - F. None of the Above
351. In order to defend your company against \_\_\_\_\_ at an OSHA hearing or in a court of law, accurate documentation of the facts is necessary.
- A. Contractors
  - B. Faulty equipment
  - C. Lawsuits
  - D. False claims
  - E. Alleged violations
  - F. None of the Above
352. All competent persons should keep a \_\_\_\_\_ to help them remember information such as the dates, temperature, conditions, trench, address, and the crew that was working.
- A. Legal pad
  - B. Excavation inspection report
  - C. Logbook
  - D. Case history
  - E. Work schedule
  - F. None of the Above

353. You, as the designated competent person, should keep a copy of the \_\_\_\_\_, your safety policy, and a copy of your written hazard communication policy with you at all times.
- |                                  |                                     |
|----------------------------------|-------------------------------------|
| A. Work progress report          | D. Competent person training manual |
| B. Excavation inspection reports | E. Work schedule                    |
| C. OSHA Construction Standards   | F. None of the Above                |

### Ladder Safety Chapter

#### Purpose

354. According to the text, employees who use ladders must be trained in \_\_\_\_\_.
- |                             |  |
|-----------------------------|--|
| A. Maintenance              | D. Proper selection, inspection, use and storage |
| B. Use of working platforms | E. Ordering replacement parts                    |
| C. Repairing broken parts   | F. None of the Above                             |
355. A large percentage of accidents in the workplace have been caused by \_\_\_\_\_.
- |                            |                            |
|----------------------------|----------------------------|
| A. Missing support braces  | D. Improper use of ladders |
| B. Too low a weight rating | E. Other locking devices   |
| C. Using metal ladders     | F. None of the Above       |

### Ladder Hazards

#### Hazards include:

356. Using a ladder with \_\_\_\_\_ is a hazard.
- |                            |                              |
|----------------------------|------------------------------|
| A. Proper locking devices  | D. All support braces intact |
| B. Working platforms       | E. Proper certification      |
| C. Missing or broken parts | F. None of the Above         |
357. Using a ladder with \_\_\_\_\_ is a hazard.
- |                            |                              |
|----------------------------|------------------------------|
| A. All rungs and steps     | D. All support braces intact |
| B. Too low a weight rating | E. Proper locking devices    |
| C. Proper certification    | F. None of the Above         |
358. Using a ladder that is \_\_\_\_\_ is a hazard.
- |                        |                                       |
|------------------------|---------------------------------------|
| A. Properly maintained | D. Too short for the intended purpose |
| B. In good repair      | E. Regularly inspected                |
| C. Properly certified  | F. None of the Above                  |
359. Using metal ladders near \_\_\_\_\_ is a hazard.
- |                     |                      |
|---------------------|----------------------|
| A. Electrical wires | D. Structures        |
| B. Trench boxes     | E. Other Ladders     |
| C. Excavations      | F. None of the Above |
360. Using ladders as a \_\_\_\_\_ is a hazard.
- |                     |                       |
|---------------------|-----------------------|
| A. Training tool    | D. Means of egress    |
| B. Working platform | E. Safety requirement |
| C. Means of access  | F. None of the Above  |
361. \_\_\_\_\_ from ladders is a hazard.
- |                    |                      |
|--------------------|----------------------|
| A. Rungs and steps | D. Support braces    |
| B. Spreaders       | E. Locking devices   |
| C. Objects falling | F. None of the Above |

**Ladder Inspection**

- 362. Ladders must be inspected before each use.
  - A. True                      B. False
  
- 363. Ladders must be inspected to make sure that \_\_\_\_\_ are free of oil, grease, dirt, etc.
  - A. All rungs and steps    D. Locking mechanisms
  - B. Spreaders    E. Safety labels
  - C. Metal parts    F. None of the Above
  
- 364. Ladders must be inspected to make sure that \_\_\_\_\_ are tight.
  - A. All fittings    D. Cables
  - B. Working platforms    E. Ropes
  - C. Safety labels     F. None of the Above
  
- 365. Ladders must be inspected to make sure that \_\_\_\_\_ or other locking devices are in place.
  - A. Ropes    D. Wooden ladders
  - B. Spreaders     E. Safety Labels
  - C. Metal ladders     F. None of the Above
  
- 366. Ladders must be inspected to make sure that non-skid safety feet are \_\_\_\_\_.
  - A. Too short     D. Properly labeled
  - B. Painted    E. Needed
  - C. In place     F. None of the Above
  
- 367. Ladders must be inspected to make sure that there are no structural defects, and that \_\_\_\_\_.
  - A. All support braces are intact                                      D. Ladders are properly color-coded
  - B. Safety labels are in place    E. Ladders are clean
  - C. Broken parts are not significant                                    F. None of the Above
  
- 368. Broken ladders must be thrown away since most ladders cannot be repaired to manufacturer specifications.
  - A. True                      B. False

**SAFETY GLOSSARY**

- 369. Visible warning barriers that keep vehicles and pedestrians from entering a construction site are called \_\_\_\_\_.
  - A. Barricades    D. Buried Structures
  - B. Bracing Systems     E. Structures
  - C. Bulges     F. None of the Above
  
- 370. \_\_\_\_\_ are devices that hold or fasten two or more parts together or in place. Braces may be diagonal or horizontal, and they may be made of wood or metal.
  - A. Barricades    D. Buried Structures
  - B. Connectors    E. Braces
  - C. Bulges     F. None of the Above

371. A part of a trench shoring system used to prevent trench walls from collapsing is called a \_\_\_\_\_.
- |                   |                      |
|-------------------|----------------------|
| A. Barricade      | D. Buried Structure  |
| B. Bracing System | E. Structure         |
| C. Bulge          | F. None of the Above |
372. A method of cutting back the sides of a trench into horizontal steps to prevent cave-ins is called \_\_\_\_\_.
- |                |                      |
|----------------|----------------------|
| A. Barricading | D. Benching          |
| B. Bracing     | E. Shoring           |
| C. Bulging     | F. None of the Above |
373. An outward swelling in the soil of a trench which may be a warning sign of trench failure is called a \_\_\_\_\_.
- |                   |                      |
|-------------------|----------------------|
| A. Barricades     | D. Swell             |
| B. Bracing System | E. Buried Structure  |
| C. Bulge          | F. None of the Above |
374. Manholes, junction boxes or catch basins are \_\_\_\_\_ that may be encountered during trenching.
- |                    |                            |
|--------------------|----------------------------|
| A. Barricades      | D. Above-ground structures |
| B. Bracing Systems | E. Buried structures       |
| C. Bulges          | F. None of the Above       |
375. Fine-grained natural soil that is plastic when moist and hard and brittle when dry is the definition of \_\_\_\_\_.
- |             |                      |
|-------------|----------------------|
| A. Gravel   | D. Clay              |
| B. Cohesion | E. Sand              |
| C. Dirt     | F. None of the Above |
376. Heavy lumps or thick groupings of soil are known as \_\_\_\_\_.
- |                      |                      |
|----------------------|----------------------|
| A. Drainage Systems  | D. Cohesive          |
| B. Diversion Ditches | E. Clumps            |
| C. Grains            | F. None of the Above |
377. The relative ability to clump together or the force holding two like substances together is the definition of \_\_\_\_\_.
- |                 |                      |
|-----------------|----------------------|
| A. Attraction   | D. Clumping          |
| B. Cohesion     | E. Heaving           |
| C. Non-Cohesion | F. None of the Above |
378. A soil is said to be \_\_\_\_\_ when it has grains that hold together and clump well.
- |              |                      |
|--------------|----------------------|
| A. Cohesive  | D. Saturated         |
| B. Wet       | E. Moist             |
| C. Clay-like | F. None of the Above |

379. The \_\_\_\_\_ is one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous or dangerous to employees. This person is trained and knowledgeable about soil analysis and the use of protective systems.
- A. Competent Person  
 B. Supervisor  
 C. Attendant  
 D. Confined Space expert  
 E. Excavation expert  
 F. None of the Above
380. A workspace that has limited or restricted means of entry or exit, is large enough for an employee to enter and perform assigned work, and is not designed for continuous occupancy by the employee is the definition of a \_\_\_\_\_.
- A. Safe work area  
 B. Excavation  
 C. Hazardous environment  
 D. Confined Space  
 E. Trench  
 F. None of the Above
381. A ditch cut around the work site to keep water from entering the trench is called a \_\_\_\_\_.
- A. Drainage System  
 B. Diversion Ditch  
 C. Grain  
 D. Sediment trap  
 E. Pedestrian hazard  
 F. None of the Above
382. A \_\_\_\_\_ is comprised of pumps, pipe or channel used to drain off rain or groundwater from inside the trench.
- A. Drainage System  
 B. Diversion Ditch  
 C. Lift station  
 D. Channel system  
 E. Dewatering method  
 F. None of the Above
383. The definition of \_\_\_\_\_ is any man-made cut, cavity trench or depression in an earth surface, formed by earth removal.
- A. Trench  
 B. Hole  
 C. Permit Required Confined Space  
 D. Confined Space  
 E. Excavation  
 F. None of the Above
384. A long narrow opening or crack in the rock or soil is called a \_\_\_\_\_. These types of cracks are often a sign of trench wall failure.
- A. Sign of non-cohesion  
 B. Break  
 C. Fissure  
 D. Stress fracture  
 E. Heaved area  
 F. None of the Above
385. \_\_\_\_\_ are soil particles that once were large rocks, but have been broken down through time and the effects of weathering. The size of a soil grain determines the stability and cohesiveness of a soil. The larger the grain is, the more unstable the soil is.
- A. Dust and dirt  
 B. Grit  
 C. Grains  
 D. Pebbles  
 E. Clumps  
 F. None of the Above
386. \_\_\_\_\_ is a loose mixture of pebbles and rock fragments, which is coarser than sand.
- A. Gravel  
 B. River rock  
 C. Sand  
 D. Clay  
 E. A clump  
 F. None of the Above

387. \_\_\_\_\_ is a layer of hard subsoil or clay that does not allow water in. It is classified as a Type A soil.
- |            |                      |
|------------|----------------------|
| A. Rock    | D. Sand              |
| B. Hardpan | E. Loamy sand        |
| C. Gravel  | F. None of the Above |
388. The swelling of a soil is called \_\_\_\_\_.
- |             |                      |
|-------------|----------------------|
| A. Heaving  | D. Saturation        |
| B. Wetness  | E. Moisture content  |
| C. Watering | F. None of the Above |
389. Braces or supports within a shoring system are called \_\_\_\_\_. They are placed against beams to resist the pressure of the earth.
- |              |                      |
|--------------|----------------------|
| A. Jacks     | D. Trench boxes      |
| B. Sheeting  | E. Shoring sheets    |
| C. Shielding | F. None of the Above |
390. Tables and charts approved by a registered professional engineer and used to design and construct a protective system is known as \_\_\_\_\_.
- |                                  |                          |
|----------------------------------|--------------------------|
| A. Resource material             | D. Training data         |
| B. Manufacturer's Tabulated Data | E. Excavation evaluation |
| C. Design criteria               | F. None of the Above     |
391. A \_\_\_\_\_ is a confined space that has one or more of these characteristics: (1) contains or has potential to contain a hazardous atmosphere, (2) contains a material that has the potential for engulfing an entrant, (3) has an internal configuration that might cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section, and/or (4) contains any other recognized serious safety or health hazards.
- |                                   |                              |
|-----------------------------------|------------------------------|
| A. Competent person space         | D. Registered confined space |
| B. Small excavation               | E. Prohibited confined space |
| C. Permit Required Confined Space | F. None of the Above         |
392. \_\_\_\_\_ includes items such as safety goggles and glasses, reflective clothing, work gloves, hard hat, safety shoes, rubber boots, earplugs or protectors, face shield and face mask or respirator.
- |                |                                  |
|----------------|----------------------------------|
| A. Protection  | D. Personal Protective Equipment |
| B. Safety gear | E. Registered protective gear    |
| C. Gear        | F. None of the Above             |
393. A \_\_\_\_\_ is a professional engineer who is registered in the state where the work is to be performed.
- |                     |                                     |
|---------------------|-------------------------------------|
| A. Technician       | D. Safety officer                   |
| B. Competent Person | E. Registered Professional Engineer |
| C. Trained employee | F. None of the Above                |
394. \_\_\_\_\_ is a type C soil with small, loose grains of disintegrated rock.
- |               |                      |
|---------------|----------------------|
| A. Sandy Loam | D. Clay              |
| B. Loamy Sand | E. Gravel            |
| C. Sand       | F. None of the Above |



395. Granular soil with enough silt and clay to make it slightly cohesive is the definition of \_\_\_\_\_.
- |               |                      |
|---------------|----------------------|
| A. Sandy Loam | D. Dirt              |
| B. Loamy Sand | E. Gravel            |
| C. Sand       | F. None of the Above |
396. The process of a soil being filled to capacity with moisture is called \_\_\_\_\_.
- |             |                      |
|-------------|----------------------|
| A. Heaving  | D. Saturation        |
| B. Wetness  | E. Moisture content  |
| C. Watering | F. None of the Above |
397. A phenomenon which happens when a trench wall is subjected to stress is called \_\_\_\_\_. Fissured cracks widen until a portion of the trench wall breaks off and slides into the trench.
- |               |                         |
|---------------|-------------------------|
| A. Compaction | D. Shear                |
| B. Settlement | E. Sloping and benching |
| C. Cracking   | F. None of the Above    |
398. \_\_\_\_\_ is a component of a trench shoring system. It consists of durable sheets of metal or wood, which are held firmly against a trench wall to prevent it from caving-in.
- |                    |                         |
|--------------------|-------------------------|
| A. A ladder        | D. A trench box         |
| B. Sheet piling    | E. Sloping and benching |
| C. A trench shield | F. None of the Above    |
399. \_\_\_\_\_ is a device which provides adequate protection from falling or collapsing earth loads. A common form of this device is called a trench box.
- |                |                      |
|----------------|----------------------|
| A. A ladder    | D. A safety harness  |
| B. A barricade | E. Shoring           |
| C. Shielding   | F. None of the Above |
400. The main method of stabilizing and supporting a trench wall to prevent cave-ins is called \_\_\_\_\_. It consists of uprights, stringers and braces.
- |                         |                      |
|-------------------------|----------------------|
| A. Sloping and benching | D. Trench boxing     |
| B. Sloughing            | E. Shoring           |
| C. Shielding            | F. None of the Above |

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