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**TRENCH SAFETY FINAL EXAMINATION**

1. Trench accidents occur:
  - a. Mostly in dry, compact soil
  - b. Mostly in clay soil
  - c. Mostly in wet soil
  - d. Any type of soil
  
2. Trench collapse occurs:
  - a. Over several days' time
  - b. Very quickly, very little warning time
  - c. Quickly, but with some warning time
  - d. Only in trenches over 5 feet deep
  
3. Trench collapse usually cause:
  - a. Critical injuries and often death
  - b. Minor injuries requiring on-site first aid
  - c. Moderate injuries requiring a visit to a doctor
  - d. Rarely causes any injuries
  
4. How much does a cubic yard of soil weigh?
  - a. 550 lbs.
  - b. 1,200 lbs.
  - c. 2,400 lbs.
  - d. Over 3,000 lbs.
  
5. How can a trapped worker die if he is only buried up to his chest?
  - a. Hypothermia
  - b. Heart attack
  - c. Blood pools in legs causing worker to loose consciousness and die
  - d. Soil pressure prevents lungs from expanding resulting in suffocation
  
6. Which of the following are components of soil?
  - a. Air
  - b. Water
  - c. Mineral particles
  - d. All of the above

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7. Water in soil:
- Is absent, except after rain
  - Only exists below the water table
  - Partially fills the soil voids
  - Has no effect on trench wall stability
8. Internal soil pressures are directed:
- Vertically
  - Laterally
  - Both vertically and laterally
  - None of the above
9. What soil weakness ultimately causes a trench wall to collapse?
- Shear
  - Tension
  - Compression
  - Lack of water
10. What causes the vertical cracks to appear in adjacent soil prior to a cave-in?
- Tension stresses due to lateral bulging of soil in the trench wall
  - Vibration from construction equipment
  - People walking next to the trench
  - Quick drying of the soil after a heavy rain
11. What can be the result of rapidly pumping water out of a trench?
- Decreases the possibility of a cave-in
  - Keeps the water from saturating the trench walls
  - Increases the possibility of a cave in
  - Has no effect on the trench
12. What effect does construction equipment have when near an excavation?
- Extra weight increases the downward force of the soil
  - Vibration partially destroys the frictional hold of soil particles
  - Increases the hazards of those working in the trench
  - All of the above

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13. The major types of soils are:
- Clay and sand
  - Cohesive and granular
  - Dirt and rock
  - Sand, clay and gravel
14. OSHA requires the soil to be tested and classified by a competent person.
- True
  - False
15. What is the principle difference in behavior between a cohesive and a granular soil?
- Cohesive soils react strongly with water; granular soils do not
  - Granular soils fail in shear; cohesive soils do not
  - Granular soils continue to become stronger as more water is added.
  - There is no discernable difference
16. Which of the following identifies a soil as granular?
- Slightly salty taste
  - Individual grains are visible with the naked eye
  - Able to roll 1/8 inch diameter thread 2 inches in length
  - Dried sample breaks easily into small clumps and easily broken further by hand
17. What are the two defining characteristics of a competent person?
- Capable and trained
  - Capable and authorized
  - Trained and authorized
  - Literate and physically fit
18. When is a competent person required on a trenching project?
- Whenever a trench exceeds 5 feet (4 feet in some states)
  - Whenever people will be entering the trench
  - Whenever an OSHA compliance officer is present
  - Whenever a trench is going to collapse
19. Who can be a competent person?
- The project engineer
  - Anyone capable and authorized
  - The job foreman
  - The project superintendent

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20. Which of the following is not a responsibility of the competent person?
- Dismiss workers who willfully violate OSHA regulations
  - Monitor water removal
  - Remove employees from a hazardous situation until hazard is removed
  - Classify the soil at the beginning of the project and as conditions change
21. In the absence of the competent person, what should the rest of the excavation crew do?
- Stop all excavation related activities
  - Call the competent person for over-the-phone instructions
  - Elect a substitute and proceed with the work
  - Do not enter the trench and call the main office for instructions
22. For which depth does a protective system need to be considered?
- Greater than 4 feet
  - Less than 20 feet
  - Any depth
  - Greater than 4 and less than 20
23. When must a professional engineer design a protective system for a trench?
- If the trench exceeds 20 feet in depth
  - If the system is of a type other than those specifically addressed in the OSHA standards
  - If a protective system component is modified from the original manufacturer's specifications
  - All of the above
24. What is the most important distinction between a shield and sloping and shoring methods?
- A shield is more portable
  - A shield must be designed by a registered professional engineer
  - Sloping and shoring prevent cave-ins; a shield protects workers from a cave-in
  - Shields can be used in unstable soils
25. Which of the following conditions is not a potential hazardous atmosphere?
- Toxic
  - Oxygen deficient
  - Temperature exceeding 110 degrees F
  - Right drive wheel

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26. The greatest area of stress in a trench is:
- At the top
  - At the bottom
  - Under the side that the spoil is on
  - On the floor of the trench
27. Trench walls that have water seeping from them tend to be stronger than a dry wall trench.
- True
  - False
28. Cracks on the surface soil adjacent to the trench indicates:
- The trench wall is settling and becoming stronger
  - The trench wall could collapse at any moment
  - The spoil should be put over the cracks to seal them
  - Normal conditions for a trench in dry areas
29. Spoil removed from a trench needs to be placed a minimum of:
- 2 feet from the edge
  - 4 feet from the edge
  - 6 feet from the edge
  - 10 feet from the edge
30. For trenches over 4 feet deep:
- A ladder every 25 feet is required for entering and exiting the trench
  - The worker can ride the bucket of the backhoe into the trench
  - Steps should be carved into the side of the trench for climbing into and out of the trench
  - There are no specific requirements for entering or exiting a trench
31. When using a trench shield, workers:
- Can be 1 foot outside of the shield
  - Can be 5 feet outside the shield if equipped with a harness and lanyard
  - Should never be outside of the shield
  - Can be outside the shield for entering or exiting purposes
32. The depth of the trench for which a shield can be used is determined by the manufacturer's tabulated data information.
- True
  - False

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33. When installing vertical aluminum shoring, the placement of the shoring is determined by:
- a. The manufacturer's tabulated data
  - b. The number of shores available
  - c. How difficult they are to work with
  - d. All the above
34. When placing vertical shoring into a trench:
- a. It is ok for a worker to be in the trench to assist installation
  - b. It should be installed the fastest way possible
  - c. It should be installed from the top of the trench
  - d. It is ok for a worker to assist inside the trench if he has a ladder nearby in case something were to go wrong
35. Vertical shoring and trench shields should be inspected:
- a. Yearly
  - b. Monthly
  - c. When brought in for service
  - d. Daily
36. How often should a trench be inspected by a competent person?
- a. At the beginning of the day
  - b. After a change in weather conditions
  - c. When cracks appear adjacent to the trench
  - d. All of the above