

Name_____ Company_____

Team Name_____ Contest Position No._____

Team Member No._____

Written Test
2009 MSHA North Central District Mine Rescue Contest
Wilmington, Illinois
November, 5 2009

1. Carbon Monoxide (CO) has a specific gravity of 0.9672 and its explosive range in normal air is 12.5 to 74.2 percent.
 - a. True
 - b. False

2. C₂H₂ has a specific gravity of 0.9107, it is slightly toxic and colorless and tasteless. Its name is:
 - a. Radon
 - b. Propane
 - c. Acetylene
 - d. Butane

3. If your team's communication system fails, the cable from the system can be used to communicate with the fresh air base as long as the cable meets the requirement's set forth in Title 30 CFR, Part 49.6.
 - a. True
 - b. False

4. The chemical symbol for propane is _____.
a. C_2H_2
b. C_3H_8
c. C_4H_{10}
d. C_2H_6
5. Breathing large amounts of _____ causes rapid breathing and insufficient intake of oxygen.
a. Carbon monoxide
b. Oxides of nitrogen
c. Carbon dioxide
d. Nitrogen dioxide
6. Second degree burns involving 15 to 30 percent of the body is an example of _____ priority conditions.
a. First
b. Second
c. Third
d. None of the above
7. Air locks are to be used by mine rescue teams
a. In place of a fresh air base
b. When closing a door or building a bulkhead behind which conditions is not definitely known
c. Before opening a barricade in bad air behind which trapped miners might be located
d. As refuges where they can remove or repair their breathing apparatus
e. All of the above
8. Equipment for exploration work falls into
a. Two categories, the equipment each team member has, and the equipment required by law
b. Three categories, the individual equipment, team equipment required by law, and other equipment
c. Two categories, the equipment each team member has, and the equipment the team uses
d. Two categories, the equipment required by law, and other equipment
e. Two categories, surface and underground
9. It is standard practice to mark bad ground conditions with chalk or some other type of marker, and note the location on the mine map.
a. True
b. False

10. Under what conditions/situations might your team captain order your team to return to fresh air immediately?
- Malfunctioning equipment
 - Hazardous ground that cannot be secured
 - The presence of gasses that produce an imminent explosion hazard
 - A fire that cannot be extinguished
 - All of the above
11. The map symbol for *Seal* is three straight lines or two straight lines with the word seal printed after them.
- True
 - False
12. If a fire begins to back up against the intake air in search of oxygen, you can put up a “transverse brattice” from side to side leaving an open space at the top. This will cause
- Decreased air flow at the back and slow down the progress of smoke
 - Increased air flow at the back and slow down the progress of smoke
 - Decreased air flow at the back and reverse the progress of smoke
 - Increased air flow at the floor and slow down the progress of smoke
 - Decreased oxygen content and prevent an explosion
13. Once a stretcher is brought into a refuge chamber or barricade, it should be checked to be sure that it will bear the weight of a person.
- True
 - False
14. The location of personal items, such as lunch buckets, cap lamps, or self rescuers should be marked on the mine map and on the side of the mine near where they are found.
- True
 - False
15. Before a team begins a rescue operation in a mine where an explosion has occurred,
- The team should make sure the main fan is running
 - The team should make sure that the mine is relatively safe to enter
 - The team should make sure that the main fan is guarded
 - A and C above
 - All of the above
16. Portable communication systems used for mine rescue work must be approved under
- CFR 30, Part 49.6(a)
 - CFR 29, Part 47
 - CFR 30, Part 23
 - CFR 30, Part 47
 - NIOSH

17. An air lock is built by building two stoppings 10 to 15 feet apart. Each stopping will have a door or flap in it so that the teams can enter and exit the sealed area.
- True
 - False
18. A regulator can be made by knocking blocks out of a permanent bulkhead.
- True
 - False
19. Dry chemical extinguishers put out the fire by stopping the chemical reaction between the :
- Fuel and ignition
 - Oxygen and ignition
 - Oxygen and fuel
 - Ignition and heat
20. Sort these conditions according to triage:
- Second degree burns on 13% of body, breathing problems, back injury with spinal injury
 - Breathing problems, back injury with spinal injury, second degree burns on 13% off body
 - Second degree burns on 13% of body, back injury with spinal injury, breathing problems
 - Back injury with spinal injury, second degree burns on 13% of body, breathing problems
21. Nitrogen, methane, carbon monoxide, and butane are all
- Highly soluble in water
 - Moderately soluble in water
 - Slightly soluble in water
 - Non-soluble in water
 - Explosive
22. after a mine rescue team returns to the fresh air base, the team will confer with the
- FAB Coordinator and the MSHA official in charge
 - Command center and the captain of the incoming team
 - FAB coordinator and the captain of the incoming team
 - MSHA official in charge and the mine manager
 - Command center and the FAB coordinator
23. Sulfur dioxide gas in concentrations as low as _____ is dangerous to life.
- 0.02 to 0.07 percent
 - 0.01 to 0.05 percent
 - 0.04 to 0.05 percent
 - 0.4 to 0.5 percent
 - 0.004 to 0.005 percent

24. Preconditions for opening a fire area should be
- a. The oxygen content of the air should be low enough so that an explosion is impossible
 - b. There should be little or no carbon dioxide present
 - c. The fire area should have cooled
 - d. All of the above
 - e. A and C only
25. Stinkdamp can be toxic and explosive
- a. True
 - b. False
26. Gas detection is an important part of any mine rescue or recovery operation. A team will make frequent tests for gases as they advance beyond the fresh air base. During the team's exploration, they will want to find out
- a. What harmful gases are present
 - b. How much oxygen is present
 - c. What the explosive range of gases is
 - d. A and B above
 - e. All of the above
27. You can detect ethane, propane, and butane with a portable detector or by chemical analysis.
- a. True
 - b. False
28. A single curvy line is a symbol for a
- a. Snake
 - b. Cable
 - c. Water hazard
 - d. Temporary bulkhead
 - e. None of the above
29. A double line with a D through it is a symbol for a
- a. Regulator
 - b. Barricade
 - c. Permanent bulkhead with man door
 - d. Mine door
 - e. Temporary bulkhead with a man door
30. A large D across a drift or crosscut is a symbol for
- a. Conveyor belt with loading and dumping points
 - b. Mine door
 - c. Man door
 - d. Regulator
 - e. None of the above

31. The height of a drift is 12 feet while the width is 30 feet. The anemometer reading is 60 feet for 45 seconds. What is the quantity of airflow in cubic feet per minute?
- 28,800
 - 25,920
 - 21,600
 - 28,200
 - 36,000
32. The chemical symbol for acetylene is
- C_2H_4
 - C_3H_6
 - C_2H_2
 - C_4H_4
 - A_2C_4
33. Basically, there are _____ way(s) to erect brattice seals.
- 3
 - 2
 - 1
 - 4
 - Several
34. All temporary seals should have provisions for collecting air samples
- True
 - False
35. When building temporary seals, one of the most important things to consider is ...
- The type of material available
 - The extent of the fire
 - The barometric pressure
 - Ventilation
 - All of the above

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ANSWER SHEET

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