

**Western Mine Rescue Association
Nevada Underground Mine Rescue Contest
March 11-14, 2024**



Directions:

- 1. Find the correct answer to each of the questions.**
- 2. Select only one answer per question.**
- 3. Then, fill in the corresponding circle on the answer sheet for each numbered question.**

Western Mine Rescue Association

Mine Rescue Competition – Written Test

1. Sulfur Dioxide Characteristics include:
 - A. 2.2638
 - B. Highly toxic and can be an asphyxiant
 - C. Explosive
 - D. A and B
2. As part of the “triage” system, survivors can be categorized into three priority groups according to their condition or injury. A survivor with multiple fractures would be a _____ condition.
 - A. Low, or third priority
 - B. Second priority
 - C. First priority
 - D. Described condition not included in any of the above priority categories.
3. All decisions concerning the mine rescue teams (scheduling, assignments, tracking, rotations, and methods of exploration or firefighting) are made by the _____.
 - A. Mine superintendent
 - B. MSHA district manager
 - C. Command center
 - D. Fresh air base coordinator
4. When a mine is sealed off for any length of time, water can collect in it. Pools of water can release ____ gases into the air when they are stirred up.
 - A. Water-soluble
 - B. Explosive and non-explosive
 - C. Poisonous and toxic
 - D. All of the above
5. The ____ is responsible for just about everything that goes on at the fresh air base.
 - A. Command center
 - B. Fresh air base coordinator
 - C. Backup team captain
 - D. Both B and C
6. When using the “triage” system to sort victims there are _____ priority groups.
 - A. Five
 - B. Two
 - C. Three
 - D. Four

7. Federal regulations require mines to have and post a Mine Rescue Notification Plan for notifying all the mine rescue team members that will be needed to assist in the rescue and recovery operation. This regulation is:
- A. 30 CFR Section 49.9
 - B. 30 CFR Section 50.2
 - C. Section 7(3) of the MINER Act of 2006
 - D. 30 CFR Section 49.1(a)
8. The rate of _____ is how quickly the gas will mix or blend with one or more other gases and how quickly it can be dispersed.
- A. temperature rise
 - B. current
 - C. pressure increase
 - D. diffusion
9. The TLV for carbon monoxide is 50 ppm. This is equivalent to _____.
- A. 50%
 - B. 0.05%
 - C. 5.0%
 - D. 0.005%
10. What is the second largest component of air?
- A. Nitrogen
 - B. Oxygen
 - C. Argon
 - D. Helium
11. MSHA requires mine rescue stations serving underground M/NM mines to have _____ gas detectors appropriate for each gas which may be encountered at the mines serviced. The detectors must measure concentrations of methane from 0.0 percent to 100 percent of volume, oxygen from 0.0 percent to at least 20 percent of volume, and carbon monoxide from 0.0 parts per million to at least 9,999 parts per million (30 CFR 49.6(a)(6))
- A. Two
 - B. Three
 - C. Four
 - D. None of the above
12. Hydrogen is highly explosive gas. Air containing _____ percent hydrogen will explode even when there is as little as 5 percent oxygen present.
- A. 0.4 to 74.2
 - B. 4.0 to 74.2
 - C. 40.0 to 74.2
 - D. None of the above

13. One of the most poisonousness gasses is Hydrogen Sulfide; concentrations of _____ to _____ percent can cause rapid unconsciousness, cessation of respiration, and death.
- A. 0.07 - 0.10 %
 - B. 0.02 - 0.07 %
 - C. 0.10 - 0.20 %
 - D. 0.04 - 0.05 %
14. Which of the following are true when pumping water?
- A. Pay special attention to ground conditions.
 - B. Water soluble gasses can be released.
 - C. None of the above.
 - D. Both of the above.
15. The amount of time a team spends underground depends upon:
- A. The conditions underground
 - B. The type of apparatus being used
 - C. Whether or not you have found the fire.
 - D. A & B
16. The team uses gas detectors to test the mine air:
- A. Every 10 feet
 - B. Whenever they feel like it
 - C. Repeatedly as they advance
 - D. Just at the fresh air base
17. During an emergency a refuge chamber is where
- A. The team preps to go under air.
 - B. The fresh air base is located;
 - C. Miners go if unable to reach the surface;
 - D. The command center is located.
18. The main task of a mine rescue team during recovery operations is to:
- A. Account for all missing miners
 - B. Bring all survivors to the surface
 - C. Reestablish ventilation
 - D. All of the above
19. During progressive ventilation as the work continues oxygen and gas levels _____.
- A. Can be ignored;
 - B. Must be carefully monitored;
 - C. Doesn't matter;
 - D. A & C.

20. What two measurements are need to determine the quantity of the airflow:
- A. Velocity and direction;
 - B. Velocity and volume of airway;
 - C. Area of airway and direction;
 - D. Area of airway and velocity
21. Malfunctioning electrical equipment producing arcs and sparks could cause:
- A. Elevated readings of Oxygen;
 - B. Elevated readings of Oxides of Nitrogen;
 - C. Elevated readings of Carbon Monoxide;
 - D. Elevated readings of Hydrogen Sulfide.
22. Section 7(3) of the MINER Act of 2006 requires that the primary communicator with the operator, miner's families, the press and the public be:
- A. Mine Manager
 - B. MSHA;
 - C. Mine HR Manager;
 - D. Company person picked by the company.
23. Duties of the mine foreman may include:
- A. Provide suitable transportation for people and supplies, as needed.
 - B. Organize underground operations for each shift in cooperation with the person in charge, Federal inspectors, and, if involved, state inspectors and union representatives.
 - C. All of the Above
 - D. None of the Above
24. No attempt should be made to unseal a fire area until:
- A. The oxygen content behind the seal is pretty low, and carbon dioxide and carbon monoxide are not present.
 - B. Carbon dioxide is not present behind the seal and the oxygen content behind the seal is pretty low, and the area behind the seal is cool.
 - C. The oxygen content behind the seal is 3.00% and carbon monoxide is not present.
 - D. The oxygen content behind the seal is low enough to make an explosion impossible, carbon monoxide has disappeared behind the seal and the area behind the seal is cool so the fire will not rekindle.
25. The two basic methods that can be used for unsealing a fire area are:
- A. Progressive ventilation and staged ventilation
 - B. Direct ventilation and rapid ventilation
 - C. Direct ventilation and progressive ventilation
 - D. Methodical ventilation and direct ventilation

26. If pressure difference exists naturally between the two airways, then the mine has _____ ventilation.
- A. Mechanical
 - B. High Pressure
 - C. High Volume
 - D. Natural
27. In a single-level, room-and-pillar mine, progressive ventilation is the usual method of recovery when _____.
- A. The sealed area is large.
 - B. The fire is extensive.
 - C. Bodies must be recovered.
 - D. All of the above
28. This can be used to control and adjust the quantity of airflow in a mine in order to ensure proper distribution.
- A. A partially opened mine door
 - B. A permanent bulkhead
 - C. An adjustable regulator
 - D. Both A and C
29. In natural ventilation, warm air displaces cold air in the mine due to differences in _____ of the workings.
- A. The physical dimensions
 - B. The material being mined and the friction factor
 - C. Elevation and Temperature
 - D. All of the above
30. When a body is found underground, do not examine the victim's clothing for personal possessions without the approval of _____.
- A. The command center
 - B. The fresh air base coordinator
 - C. The next of kin
 - D. None of the above

Western Mine Rescue Association

Mine Rescue Competition – Answer Key

ANSWER KEY

- | | | |
|--------------|-----------|-----------------------|
| 1. D | pg. 2-21 | MSHA Publication 3027 |
| 2. B | pg. 6-6 | MSHA Publication 3027 |
| 3. C | pg. 1-3 | MSHA Publication 3027 |
| 4. D | pgs. 2-10 | MSHA Publication 3027 |
| 5. B | pg. 4-9 | MSHA Publication 3027 |
| 6. C | pg. 6-5 | MSHA Publication 3027 |
| 7. A | pg. 1-3 | MSHA Publication 3027 |
| 8. D | pg. 2-5 | MSHA Publication 3027 |
| 9. D | pg. 2-9 | MSHA Publication 3027 |
| 10. B | pg. 2-14 | MSHA Publication 3027 |
| 11. C | pg. 2-3 | MSHA Publication 3027 |
| 12. B | pg. 2-18 | MSHA Publication 3027 |
| 13. A | pg. 2-20 | MSHA Publication 3027 |
| 14. D | pgs. 7-2 | MSHA Publication 3027 |
| 15. D | pg. 4-31 | MSHA Publication 3027 |
| 16. C | pg. 2-4 | MSHA Publication 3027 |
| 17. C | pg. 6-14 | MSHA Publication 3027 |
| 18. C | pg. 7-4 | MSHA Publication 3027 |
| 19. B | pg. 7-8 | MSHA Publication 3027 |
| 20. D | pg. 3-19 | MSHA Publication 3027 |
| 21. B | pg. 2-18 | MSHA Publication 3027 |
| 22. B | pg. 1-5 | MSHA Publication 3027 |
| 23. C | pg. 1-7 | MSHA Publication 3027 |
| 24. D | pg. 7-17 | MSHA Publication 3027 |
| 25. C | pg. 7-7 | MSHA Publication 3027 |
| 26. D | pg. 3-5 | MSHA Publication 3027 |
| 27. D | pg. 7-7 | MSHA Publication 3027 |
| 28. D | pg. 3-12 | MSHA Publication 3027 |
| 29. C | pg. 3-5 | MSHA Publication 3027 |
| 30. D | pg. 6-11 | MSHA Publication 3027 |