**Southwest WY Mutual Aid Association**

**2016 Underground Mine Rescue Competition**

**Rock Springs, WY**

**June, 2016**

**MINE RESCUE WRITTEN TEST answer key & reference**

Name:

Team:

Member Number:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. 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.

1. True \* (Page 1-3 of Pub 3027 Module 1)
2. False

2. Duties of the mine foreman may include:

1. Provide suitable transportation for people and supplies, as needed.
2. Organize underground operations for each shift in cooperation with the person in charge, Federal inspectors, and, if involved, state inspectors and union representatives.
3. All of the Above \* (Page 1-7 of Pub 3027 Module 1)
4. None of the Above

3. Located at the top of the chain of command is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or a designated responsible person who delegates duties to other people?

1. Chief State Mine inspector
2. Mine Superintendent \* (Page 1-6 of Pub 3027 Module 1)
3. MSHA District Manager
4. None of the above

4. Gas detectors must measure concentrations of carbon monoxide from 0.0 parts per million to at least 20,000 parts per million?

1. True
2. False \* (Page 2-3 Pub 3027 module 2)

5. Another way to test for gasses is to collect air samples in the following

1. Special syringes
2. Evacuated bottles
3. Gas or liquid displacement containers
4. All of the above \*(Page 2-4 Pub 3027 module 2)
5. Which of the following is true?
6. A decrease in temperature & decrease in pressure causes a gas to contract.\*
7. A decrease in pressure causes a gas to expand.
8. An increase in temperature causes a gas to expand.
9. All of the above \*(Page 2-5 Pub 3027 module 2)

7. Any flammable gas can explode under certain conditions. What are the conditions necessary?

1. A source of ignition & enough of the gas in the air
2. Enough of the gas in the air
3. Enough oxygen, a source of ignition & enough of the gas in the air \* (page 2-7 Pub 3027 module 2)
4. Enough oxygen & enough of the gas in the air

8. The degree to which a toxic gas will affect you depends on three factors

1. Length of time since blasting, toxicity of the gas & length of your sleeves.
2. Concentration of the gas, toxicity of the gas & length of exposure \* (Page 2-9 Pub 3027 module 2).
3. Concentration of the gas, specific gravity of the gas & length of exposure
4. Toxicity of the gas, specific gravity of the gas, & high TLV.
5. If you know the specific gravity of a gas; you will know
6. Where you should test for it.
7. How quickly it will diffuse.
8. How easily it can be dispersed by ventilation.
9. All the above \* (Page 2-6 Pub 3027 module 2)
10. Water soluble gasses can be liberated when water pools are disturbed. Which gasses are highly soluble in water?
11. Hydrogen sulfide and hydrogen
12. Methane and acetylene
13. Nitrogen and sulfur dioxide
14. Hydrogen sulfide and sulfur dioxide \* (page 2-7 Pub 3027 module 2)
15. For all mines, rescue teams must know how to test for:
16. Carbon dioxide and oxygen deficiency
17. Oxygen deficiency and carbon monoxide \* (page 2-12 Pub 3027 module 2 )
18. Both a and b.
19. Hydrogen sulfide and oxygen deficiency
20. These gasses can be detected by taste.
21. Sulfur dioxide, butane, carbon monoxide
22. Hydrogen sulfide, nitrogen, nitrogen dioxide
23. Acetylene, hydrogen sulfide, sulfur dioxide \* (Page 2-47 Pub 3027 module 2)
24. Carbon dioxide, acetylene, carbon monoxide
25. What is blackdamp?
	1. Carbon dioxide, nitrogen and air \* (Page 2-29 Pub 3027 module 2)
	2. Carbon monoxide and air
	3. Hydrogen sulfide and air
	4. Methane and air
26. This is the usual map symbol for:
27. Bulkhead
28. Fan
29. Overcast
30. Undercast \* (page 3-7 Pub 3027, module 3)
31. This is the usual map symbol for:
32. Mandoor
33. Permanent Bulkhead \* (page 3-13 Pub 3027 module 3)
34. Track
35. Conveyor belt
36. Mine rescue teams should never alter the existing ventilation without direct orders from the command center.
37. True \* (Page 3-15 Pub 3027 module 3)
38. False
39. Air locks are required when opening a refuge chamber or barricade in irrespirable atmospheres.
	1. True \* (Page 3-24 Pub 3027 module 3)
	2. False
40. Handling communications with the team and the command center, mapping the team’s progress and findings and coordinating and overseeing the activities of all personnel at the fresh air base are the duties of the (
	1. Team trainer
	2. Mine superintendent
	3. Fresh air base coordinator \* (Page 4-11 Pub 3027 module 4)
	4. MSHA representative
41. In addition to the equipment any miner wears when going underground and their breathing apparatus, what equipment is a mine rescue team required to have?
42. A gas detector for each team member and a communication system.
43. Two detecting devices for each gas they may encounter, two oxygen indicators & a communication system. \* (Page 4-18 Pub 3027 module 4)
44. A gas detector for each team member, a communication system, scaling bar & walking stick.
45. A communication system, a gas detector, blankets and a horn.
46. As you explore, the team’s priorities in order are:
47. Team safety, rescue of survivors , & recovery of the mine \* (page 4-12 Pub 3027 module 4)
48. Rescue of survivors, team safety, & recovery of the mine
49. Team safety, recovery of the mine & rescue of survivors
50. Rescue of survivors, recovery of the mine, & team safety
51. The signals by horn or pull on the comm line most commonly used during exploration are: one signal = stop; two signals = retreat; three signals = advance; 4 signals = distress or emergency
	1. True
	2. False \* (Page 4-21 Pub 3027 module 4)
52. It is generally recommended that mine rescue teams use multipurpose dry chemical extinguishers which contain what chemical?
	1. Monoammonium phosphate \* (Page 5-6 Pub 3027 module 5)
	2. Monosodium phosphate
	3. Magnesium phosphate
	4. Ammonium chlorate
53. What type of fire is involves electrical components?
	1. Class A
	2. Class B
	3. Class C \* (Page 5-5 Pub 3027 module 5)
	4. Class D
54. A survivor with the following conditions or injuries (severe head injuries, inhalation of poisonous gasses, and multiple fractures) would be classified as:
55. First Priority \*(Page 6-5 Pub 3027 module 6)
56. Second Priority
57. Third Priority
58. Immediate Priority
59. The first thing a rescue team should do when encountering a refuge chamber is to erect an airlock before entering the refuge chamber.
60. True
61. False \* (Page 6-4 Pub 3027 module 6)
62. When you have located survivors in a refuge chamber or barricade, the team captain will then determine whether to advance fresh air or build an air lock.
	1. True
	2. False \* (Page 6-4 Pub 3027 module 6)
63. A survivor with abrasions, second degree burns over 10% of his body, and a fractured arm would be classified as:
	1. First Priority
	2. Second Priority
	3. Third Priority \* (page 6-6 Pub 3027 module 6)
	4. Delayed Priority
64. No attempt should be made to unseal a fire area until:
65. The oxygen content behind the seal is pretty low, and carbon dioxide and carbon monoxide are not present.
66. 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.
67. The oxygen content behind the seal is 3.00% and carbon monoxide is not present.
68. 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. \* (Page 7-17 Pub 3027 Module 7)
69. The two basic methods that can be used for unsealing a fire area are:
	1. Progressive ventilation and staged ventilation
	2. Direct ventilation and rapid ventilation
	3. Direct ventilation and progressive ventilation \* (Page 7-7 Pub 3027 Module 7)
	4. Methodical ventilation and direct ventilation

30. The usual method of recovery when the sealed area is large in a single level mine is:

1. Direct ventilation
2. Progressive ventilation \* (Page 7-7 Pub 3027 module 7)
3. Rapid ventilation
4. Brattice ventilation