

**Southwest Wyoming Mutual Aid Mine Rescue Contest
Rock Springs WY
June 10-12, 2014**

Biomarine Breathing Apparatus Team Test

Company Name _____

Team Name _____

Name _____

1. MSHA requires mine rescue stations serving underground M/NM mines to have six gas detectors appropriate for each gas which may be encountered at the mines served.

- a) True
- b) False

2. In addition, gas 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.

- a) True
- b) False

3. The volume of a gas changes in response to any change in atmospheric pressure or temperature. For example: An increase in temperature causes a gas to contract.

- a) True
- b) False

4. The specific gravity of normal air is _____?

- a) 1.5
- b) 2.0
- c) 1.0
- d) 1.5

5. Sulfur dioxide, for example, has a specific gravity of 2.2638.
- a) 2.2635
 - b) 2.2638
 - c) 2.2538
 - d) 2.3838
6. The explosive range of hydrogen, for example, is ___ to ___ percent in the presence of normal air.
- a) 3.0 to 75.2
 - b) 5.0 to 76.3
 - c) 4.0 to 72.2
 - d) 4.0 to 74.2
7. In order to get the air to flow from the intake to the exhaust, the exhaust air must be at a higher pressure than the intake.
- a) True
 - b) False
8. Bulkheads are used to direct air to where it is needed and to keep intake air from short circuiting to the exhaust before it reaches the working area.
- a) True
 - b) False
9. Check curtains are used to deflect the exhaust air current into a working area.
- a) True
 - b) False
10. Any teams working beyond the established time period will be notified by the #2 Judge that they must leave the field.
- a) True
 - b) False
11. MSHA requires Periodic Maintenance should be performed at least _____ on Mine Rescue Breathing Apparatus
- a) Daily
 - b) Weekly
 - c) Every 30 days
 - d) Quarterly

12. Carbon Fiber wrapped Oxygen cylinders must be hydrostatically tested every _____

- a) One year
- b) Three years
- a) Five years
- b) Fifteen Years

13. Batteries may be replaced

- a) In an oxygen enriched atmosphere
- b) In a safe area known to be free of explosive gasses
- c) Anywhere underground during a rescue mission
- d) None of the above

14. In a properly working positive pressure NIOSH/MSHA approved Closed Circuit breathing apparatus the pressure inside the breathing loop/circuit is

- a) Lower than ambient
- b) The same as ambient
- c) The same as cylinder pressure
- d) Slightly higher than ambient

15. If a slight leak occurs in the breathing loop/circuit or facemask seal, the user generally will

- a) Hit the demand valve more often
- b) Reduce duration
- c) Increase oxygen consumption
- d) All of the above
- e) None of the above

16. Turn-around Maintenance should be performed

- a) As soon as possible after each use
- b) On a monthly basis
- c) During periodic maintenance
- d) During long-term maintenance
- e) None of the above

17. There are various methods to eliminate or reduce mask fogging. Which one is the least likely to work
- a) Depress the emergency By-Pass valve
 - b) Use an approved wiper
 - c) Use an approved anti-fog spray or solution
 - d) B & C
18. The check valves in hose adapter perform a critical function. Which of the following is NOT true
- a) They control the directional flow of inhalation and exhalation gasses
 - b) They control the amount of oxygen being metered out from the oxygen cylinder
 - c) The inhalation valve is closed during exhalation
 - d) The exhalation valve is closed during inhalation
19. When completing washing/disinfection during turn-around maintenance users may use any antibacterial cleaner they choose because
- a) Bleach works on any germ so I can use it
 - b) Alcohol is used in hospitals so it works on my apparatus
 - c) Any liquid detergent is OK since it won't hurt my skin
 - d) None of the above
20. My Mine Rescue closed circuit breathing apparatus does NOT use air in the cylinder because
- a) Air does not have any oxygen
 - b) Air has too much CO₂
 - a) The manufacturer specifies oxygen and air does NOT have enough oxygen
 - b) Air tastes bad
21. If your oxygen cylinder was filled with air what would happen if a member of my team used the apparatus
- a) Not enough CO₂ would be scrubbed or removed
 - b) Nothing, they would only get about 21% of the four-hour rated duration
 - c) They would not get enough oxygen and will pass out quickly
 - d) They will get CO₂ poisoning

22. What will BEST result in the best cooling of breathing gasses

- a) Install the gel tube/ice canister just prior to donning
- b) Install the gel tube/ice canister during benching back at the rescue station
- c) Do not use the gel tube/ice canister at all
- d) Use only partially frozen gel tube/ice canister

23. During rescue operations in oxygen deficient and high CO atmosphere a team member's apparatus goes into low Oxygen alarm. Which best describes your actions

- a) Do nothing, press on with the rescue
- b) Tell the member to breath slower
- c) Tell the member to go back to the fresh air base alone
- d) Each team member checks their oxygen supply and the team retreats to correct the problem
- e) Have him remove his mask and change out the oxygen cylinder

24. When refilling your oxygen cylinder it is NOT acceptable to

- a) Fill the cylinder to 4000 psig so I can get more than 4-hours
- b) Use lubricants such as Vaseline or petroleum jelly on the cylinder components
- c) Use welders grade oxygen
- d) Use your booster pump in an area filled with hydrocarbons and ignition sources
- e) All the above

25. Under extremely heavy work conditions, if the user inhales and collapses the diaphragm as far as it can travel, it activates the

- a) By-Pass Valve
- b) Demand Valve
- c) Relief Valve
- d) Check Valve

26. If the constant add or the demand valve fails in your apparatus, the user can still manually fill the breathing chamber by activating the

- a) Emergency By-Pass Valve
- b) Demand Valve
- c) Relief Valve
- d) Check Valve

27. If the user exhales and the breathing diaphragm/breathing chamber fills to a specified capacity, the breathing chamber will cause the activation of the

- a) By-Pass Valve
- b) Demand Valve
- c) Relief/vent Valve
- d) Check Valve

28. What specifically controls the directional flow of the breathing gasses:

- a) The hoses
- b) The mask
- c) The breathing bag or chamber
- d) The CO₂ scrubber/absorber
- e) The check valves

29. Typically a Closed Circuit Breathing Apparatus has:

- a) Cylinder or High pressure, regulated or reduced pressure, and breathing circuit or breathing loop pressure
- b) Only oxygen pressure
- c) Only Oxygen and CO₂ pressure
- d) Only Mask pressure

30. The function of the regulator is to:

- a) Increase cylinder pressure in the apparatus
- b) Moisture control
- c) Decrease cylinder pressure in the apparatus plumbing and pneumatics
- d) A & C