

Missouri Mine Rescue Contest
Rolla, MO
September 23-25, 2014
Technician Team (BioPak 240R)

1. MSHA requires Periodic Maintenance should be performed at least ____ on Mine Rescue Breathing Apparatus.
 - A. Daily
 - B. Weekly
 - C. Every 30 days
 - D. Quarterly

2. Carbon Fiber wrapped Oxygen cylinders must be hydrostatically tested every _____ .
 - A. One Year
 - B. Three Years
 - C. Five Years
 - D. Fifteen Years

3. 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

4. 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

5. 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
 - A. None of the Above

6. 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

7. The Check valves in mask/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

8. 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

9. 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
 - C. The manufacturer specifies Oxygen
 - D. Air has 21% oxygen by volume, & for Closed-Circuit apparatus that is not enough
 - E. Both C & D

10. What will 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

11. 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 a booster pump in an area filled with hydrocarbons and open ignition sources
 - E. All the above

12. 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

13. 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

14. 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

15. 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

16. 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
17. 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
18. When my CO₂ absorbent is used up, the material now becomes:
- A. Lithium Hydroxide
 - B. Limestone (Calcium Carbonate)
 - C. Lithium Carbonate
 - D. Magnesium Hydroxide
 - E. Calcium Hydroxide
 - F. None of the above
19. If you hear the Demand every time you inhale, and you are not working hard, you should:
- A. Use the Emergency By-Pass Valve
 - B. Breathe slower
 - C. Turn off the oxygen cylinder
 - D. Check your facemask fit and adjust it for a better seal
20. The purpose of the CO₂ absorbent is to ensure:
- A. Carbon Monoxide is removed from the breathing gasses
 - B. Carbon Dioxide is removed from the exhaled breathing gasses
 - C. The correct amount of Oxygen is metered out
 - D. The oxygen tastes good
21. The smoke tube is used mainly to determine what direction very slow-moving oxygen is moving, and at what velocity.
- A. True
 - B. False
22. _____ are devices used to control and adjust the quantity of airflow in the mine.
- A. Anemometers
 - B. Auxiliary Fans
 - C. Regulators
 - D. None of the above
23. To obtain the “flow” of air through the mine there must be a difference in air quality between the intake and exhaust airways.
- A. True
 - B. False
24. If placards have not been changed after _____ seconds, teams must assume that their actions were not successful.
- A. 10
 - B. 20
 - C. 15
 - D. 30

25. No team member may advance more than (3) feet beyond the second (2nd) intersection before tying across and/or behind into all unexplored areas that intersect.
- A. True
 - B. False
26. The captain must verbally indicate to the judges each time initials and dates are simulated.
- A. True
 - B. False
27. Whether to use regulators to control the fire or to entirely seal the fire must be decided by the _____.
- A. Fresh Air Base Attendant
 - B. Mine Manager
 - C. Team
 - D. Command Center
28. The most dangerous aspect of methane is the fact that it is toxic.
- A. True
 - B. False
29. Knowing the effects of air current, temperature, and pressure on a gas will help you determine its rate of diffusion.
- A. True
 - B. False
30. Your team will make frequent tests for gases as it advances beyond the portal.
- A. True
 - B. False