

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

Biomarine Breathing Apparatus Team Technician Test Answers

1. b) MSHA requires mine rescue stations serving underground M/NM mines to have **four** gas detectors appropriate for each gas which may be encountered at the mines served. *MSHA Publication 3027, Page 2-3*

2. a) 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. *MSHA Publication 3027, Page 2-3*

3. b) 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 **expand**. *MSHA Publication 3027, Page 2-5*

4. c) The specific gravity of normal air is **1.0**
MSHA Publication 3027, Page 2-6

5. b) Sulfur dioxide, for example, has a specific gravity of **2.2638**. *MSHA Publication 3027, Page 2-6*

6. d) The explosive range of hydrogen, for example, is **4.0 to 74.2** percent in the presence of normal air. *MSHA Publication 3027, Page 2-7*

7. b) In order to get the air to flow from the intake to the exhaust, the exhaust air must be at a **lower** pressure than the intake. *MSHA Publication 3027, Page 3-5*

8. a) 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. *MSHA Publication 3027, Page 3-8*

9. a) Check curtains are used to deflect the **intake** air current into a working area. *MSHA Publication 3027, Page 3-9*

10. b) Any teams working beyond the established time period will be notified by the #1 Judge that they must leave the field. 2014 Metal/Non Metal Mine Rescue Rules *Page 7*

11. c) MSHA requires Periodic Maintenance should be performed at least every **30 days** on Mine Rescue Breathing Apparatus MSHA Miners Act, BioPak 240 R Benchman manual Rev I, page 15

12. c) Carbon Fiber wrapped Oxygen cylinders must be hydrostatically tested every **five years**. BioPak 240 R User Rev H & Benchman Manual Rev I page 7, 18, DOT Regulations

13. b) Batteries may be replaced **In a safe area known to be free of explosive gasses** BioPak 240 R USER Manual p. 7,8 Benchman Instruction Manual Rev I page 7, 8 & 1

14. d) In a properly working positive pressure NIOSH/MSHA approved Closed Circuit breathing apparatus the pressure inside the breathing loop/circuit is **Slightly higher than ambient** BioPak 240 R Benchman Instruction Manual Rev I page 22, 25, USER Test Q # 9

15. d) If a slight leak occurs in the breathing loop/circuit or facemask seal, the user generally will: BioPak Benchman Manual Rev I page 22, USER test Q # 4

16. a) Turn-around Maintenance should be performed **as soon as possible after each use**. BioPak 240 R Benchman Instruction Manual Rev I page 9

17. a) There are various methods to eliminate or reduce mask fogging. Which one is the least likely to work: **Depress the Emergency By-Pass Valve** BioPak 240 R Benchman manual Rev I, page 22, BioPak 240 R USER Test Q # 24

18. b) The Check valves in hose adapter perform a critical function. Which of the following is not true: **They control the amount of oxygen being metered out from the oxygen cylinder** BioPak 240 R USER test Q # 30, BioPak 240 R USER manual Rev H, page 12

19. d) When completing washing/disinfection during turn-around maintenance users may use any antibacterial cleaner they choose because **None of the above** BioPak 240 R Benchman Test Q 8, Benchman Instruction Manual Rev I page 6, 7, 10

20. c) My Mine Rescue Closed Circuit Breathing Apparatus does not use AIR in the cylinder because: **The manufacturer specifies Oxygen and Air does not have enough oxygen** BioPak 240 R Benchman Instruction Manual Rev I page 7, 10

21. d) If your oxygen cylinder was filled with Air what would happen if a member of my team used the apparatus: **Violating the manufacturer's use and care instructions voids my NIOSH/MSHA approval**. BioPak 240 R Benchman Instruction Manual Rev I page 6, 7, 10

22. a) What will BEST result in the best cooling of breathing gasses: **Install the gel tube/ice canister just prior to donning** BioPak 240 R Benchman Instruction Manual Rev I p. 19, USER Manual Rev H, p. 11, 24
23. d) 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: **Each team member checks their oxygen supply and the team retreats to correct the problem.** BioPak 240 R Benchman Manual Rev I, page 7, USER manual Rev H, page 7, 14, 15, 18
24. e) When refilling your oxygen cylinder it is NOT acceptable to: **All the above** BioPak 240 R USER manual Rev H, p. 7 Benchman Manual Rev I, p. 7, 9, 10, 11, 18, 25
25. b) Under extremely heavy work conditions, if the user inhales and collapses the diaphragm as far as it can travel, it activates the **Demand Valve** BioPak 240 R User Manual, Rev H, p. 17, Benchman Manual p. 15,
26. a) If the constant add or the demand valve fails in your apparatus, the user can still manually fill the breathing chamber by activating the **Emergency Bypass Valve** BioPak 240 R User Manual Rev H, p. 16, 17
27. c) If the user exhales and the breathing diaphragm/breathing chamber fills to a specified capacity, the breathing chamber will cause the activation of the **Relief/vent Valve** BioPak 240 R Benchman's quiz, Rev B page 5 Q # 33
28. e) What specifically controls the directional flow of the breathing gasses **The check valves** BioPak 240 R USER Quiz Rev A, page 5, Q # 30, Benchman's Quiz, Rev B, p. 5 Q # 34
29. a) Typically a Closed Circuit Breathing Apparatus has: **Cylinder or High pressure, regulated or reduced pressure, and breathing circuit or breathing loop pressure** BioPak 240 R Benchman's Quiz, Rev B, p. 5, Q # 35
PSS BG 4 Service Manual *Page 50*
30. c) The function of the regulator is to: **Decrease cylinder pressure in the apparatus plumbing and pneumatics** BioPak 240 R Benchman's Quiz, Rev B, p. 2 Q # 14