

Test – Answer – page – Module – Bio Pak
2014 Dalton GA

MSHA Publication 3027 (formerly IG 6-Instructor’s Manual for Mine
Rescue training) Module 2-Mine Gases and Module 3-Ventilation,
Mine Rescue Contest Rules/Bio Pak

Name _____ Company _____

Team Name _____ Contest Position Number _____

Team Member Number _____

Directions: circle the letter preceding the correct answer to each of the
following questions: Circle only one answer per question

1. When the barometer falls, this means:
 - a. **Gases will diffuse more quickly--- Module 2-page12**
 - b. The atmospheric pressure is rising
 - c. It is much easier for explosive gases to build up
 - d. Gases are squeezed into a smaller area

2. Methane is most explosive at what range
 - a. 5% to 15% with at least 12.1% oxygen
 - b. 9.5% to 12.5% with at least 12.1% oxygen
 - c. 5% to 10%
 - d. **9.5% to 10%--Module 2 – page 43**

3. Electrical malfunctions can produce oxides of nitrogen
 - a. **True Module 2 – page 35**
 - b. False

4. Usually, the measured distance using a smoke tube is
_____ feet
 - a. 100
 - b. 50
 - c. 75
 - d. **25 – Module 3 – page 31**

5. Asphyxiating gases
 - a. Can, in all cases, be tasted, smelled, or seen
 - b. Cause suffocation – Module 2 – page 19**
 - c. Cause the metal parts of an apparatus to corrode
 - d. Do not produce an oxygen deficient atmosphere

6. The explosive range of hydrogen is _____ to 74.2%
 - a. 7%
 - b. 5%
 - c. 4%--Module 2 – page 71**
 - d. 3%

7. An anemometer is a small windmill device with a mechanical counter that measures air velocities of over _____ feet per minute
 - a. 100
 - b. 110
 - c. 120 – Module 3 – page 27**
 - d. None of the above

8. Mine ventilation air always moves from _____
 - a. Neutral pressure regions to atmospheric pressure regions
 - b. Low pressure regions to high pressure regions
 - c. High pressure regions to low pressure regions – Module 3 – page 8**
 - d. Balanced pressure regions to unbalanced pressure regions

9. A partially opened mine door can be used as a regulator
 - a. True Module 3 – page 21**
 - b. False

10. The most accurate measurement of air velocity using a smoke tube is obtained by releasing smoke in the center of the airway
 - a. True
 - b. False – Module 3 – page 30**

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11. Under extremely heavy work conditions, if the user inhales and collapses the diaphragm as far as it can travel, it activates the
- By-Pass Valve
 - Demand Valve – page 15,22**
 - Relief Valve
 - Check Valve
1. 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 By-Pass Valve – page 16,17**
 - Demand Valve
 - Relief Valve
 - Check Valve
2. If the user exhales and the breathing diaphragm/breathing chamber fills to a specified capacity, the breathing chamber will cause the activation of the
- By-Pass Valve
 - Demand Valve
 - Relief/vent Valve – page 5 Q #33**
 - Check Valve
3. What specifically controls the directional flow of the breathing gasses
- The hoses
 - The mask
 - The breathing bag or chamber
 - The CO₂ scrubber/absorber
 - The check valves – page 5 Q# 34**

4. Typically a Closed Circuit Breathing Apparatus has
 - a. **Cylinder or High pressure, regulated or reduced pressure, and breathing circuit or breathing loop pressure – page 5 Q #33**
 - b. Only oxygen pressure
 - c. Only oxygen and CO₂ pressure
 - d. Only mask pressure

5. 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 – page 2 Q# 14**
 - d. A & C

6. When my CO₂ absorbent is used up, the material now becomes
 - a. Lithium Hydroxide
 - b. **Limestone (Calcium Carbonate) – page 9**
 - c. Lithium Carbonate
 - d. Magnesium Hydroxide
 - e. Calcium Hydroxide
 - f. None of the above

7. 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 if for a better seal – page 1 Q# 4**

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8. 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 breathing gasses – page 2 Q 35**
 - c. The correct amount of Oxygen is metered out
 - d. The oxygen tastes good

9. Which of the following is a correct statement
 - a. It is acceptable to reuse CO₂ absorbent
 - b. It is acceptable to use unapproved CO₂ absorbent material in my apparatus
 - c. CO₂ absorbent material left exposed to ambient air for 48 hours is approved for use
 - d. It is acceptable to store CO₂ absorbent is temperatures below freezing
 - e. None of the above – page 9, 11, 12**

10. Higher than normal breathing temperatures may be caused by
 - a. Higher than normal ambient temperatures
 - b. Failure to install ice canister/ gel tube
 - c. Low working rates
 - d. A & B – page 6, 11, 24**

11. During turn-around maintenance one of the NIOSH/MSHA or manufacturer required tests fails. What is the best action to take
 - a. Ignore the failure and place the apparatus in to service, they won't notice it
 - b. Troubleshoot per the manufactures requirements, document the issue and isolate the part, repair or replace or tag out the apparatus – page 6, 7, 9-14**
 - c. Just start replacing components until the problem goes away
 - d. None of the above

12. Prior to donning the apparatus you notice that the harness has been modified by a previous user. The user punched extra holes in the straps to hold some of his gear and now the harness appears compromised. What best describes your actions
- Do nothing, everyone does it and it's not going to hurt anything, it's just the harness
 - Scream obscenities at the guy who last used it telling him he just ruined a perfectly good harness
 - Replace or repair the harness per the manufacturer's recommendations – page 2 Q #6**
 - None of the above
13. During a successful underground mission one of your team members complained of higher than normal breathing resistance. What is NOT the cause
- Forgot to anti-fog the mask – page 23**
 - Check valves are stuck
 - Hoses were crimped or crushed
 - Springs were installed incorrectly
 - All of the above
14. What BEST describes when the NIOSH/MSHA low oxygen indicator alarm activates
- High CO₂ levels
 - There is a leak
 - At 20-25% end of service life, or about 750 psi remaining pressure – page 2 Q # 7, Q #49**
 - At start up
15. The oxygen booster pump should be stored in an area free of
- Air
 - Dirt, oils, and grease
 - Numerous ignition sources
 - Gasoline
 - All the above
 - B, C & D – page All pump manufactures guidelines**

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16. It is an acceptable practice to store your apparatus for long term in the manufacturers hard storage case when it is
- Clean but wet
 - Right after it has been used and wet
 - Washed/disinfected, dried and properly assembled for storage and properly benched – page 14**
 - Just throw it in the case and let someone else worry about it later
17. You notice a high pressure leak on one of your oxygen fittings. Which is most correct
- Use an oily and dirty tool
 - Work on it after it has been depressurized
 - Use the correct tool, cleaned for use around oxygen
 - Tightened beyond the manufacturers specifications to ensure it does not leak again
 - B & C – page 16**
 - None of the above
18. What BEST describes Long-Term Maintenance testing
- Delaying Turn-Around Maintenance for 30 days
 - Open the case and look it over
 - Wear it for 10 minutes and then put it away
 - Follow the manufacturer's recommendation in the User or Benchman Manual – page 15-20**
19. The approved NIOSH/MSHA and manufacturer rated duration of my Closed Circuit Breathing Apparatus is
- 1-Hour
 - 2-Hour
 - Variable
 - 3-Hours
 - 4-Hours – page 25**