**2014 Northern Mine Rescue Contest**

**Written Exam**

**(Technician Team – BG-4)**



**2010**

**2014**

**June 17, 2014**

**Findley Lake, New York**

**2014 Northern Mine Rescue Contest**

**Findley Lake, NY**

**Written Test – Technician Team – BG-4**

**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Company\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Team Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Contest Position No.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Team Member No.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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

1. Specific gravity is the weight of a gas compared to an equal volume of normal air under different temperature and pressures.
2. True
3. False
4. Elevated nitrogen levels indicate an oxygen \_\_\_\_\_\_ atmosphere.
   1. Deficient
   2. Rich
   3. Normal
   4. Elevated
5. The most dangerous aspect of methane is that it is \_\_\_\_\_.
   1. Toxic
   2. An oxygen displacer
   3. Water Soluble
   4. Explosive
6. Smoke is defined as tiny particles of \_\_\_\_ and liquid suspended in air.
   1. Solid
   2. Gas
7. Ethane, Propane and Butane are classified as light hydrocarbons.
   1. True
   2. False
8. A battery warning 1 allows the user to safely use the BG-4 for up to \_\_\_ hours.
9. 2
10. 3
11. 4
12. 5
13. Operation without an ice pack is only permitted when ambient air temperatures are below 32 degrees Fahrenheit.
14. True
15. False
16. Oxygen used in the BG-4 must have a purity of 99.25% or greater.
17. True
18. False
19. When checking the inhalation valve, the RZ 25 tester is placed into the pump \_\_\_\_\_\_\_\_ pressure position.
20. Positive
21. Negative
22. The oxygen cylinder should be recharged when below \_\_\_\_ psi.
23. 3120
24. 3680
25. 2600
26. 1957
27. When checking the minimum valve, the admission pressure of the minimum valve must be between 0.5 and \_\_\_ mbar.
28. 2.0
29. 3.0
30. 2.5
31. 3.5
32. The last low pressure warning occurs when the pressure has dropped to approximately \_\_\_\_ Bar.
33. 15
34. 10
35. 17
36. 25
37. The motion sensor on the BG-4 alarms after approximately \_\_\_\_ seconds of no movement.
38. 10
39. 20
40. 15
41. 25
42. The first residual pressure warning is generated when the pressure drops below \_\_\_\_\_ psi.
43. 700
44. 735
45. 680
46. 820
47. Acetone, trichloroethylene and bleaches are acceptable to use as a detergent when cleaning the BG-4.

A. True

B. False

1. The maximum drying temperature for BG-4 parts is \_\_\_\_\_ degrees Fahrenheit.
2. 120
3. 130
4. 140
5. 150
6. When the Sentinel is not used for longer periods of time, the battery should be removed.
7. True
8. False
9. The weight of a BG-4 including 1.4 kg of ice, full-face mask, CO2 absorber and a charged oxygen cylinder is \_\_\_\_ lbs.
10. 32
11. 41
12. 35.7
13. 30
14. The BG-4 sentinel unit requires a \_\_\_ battery.
15. 9 volt
16. AA
17. AAA
18. C
19. Ice packs which are small, broken up or not completely frozen will increase available service time.
20. True
21. False
22. The protective cover of the BG-4 is cosmetic and its use is optional.
23. True
24. False
25. Because the battery in the BG-4 is of a low voltage, it is OK to change the battery in an explosive atmosphere if necessary.
26. True
27. False
28. Which should be pressed to administer more oxygen to the wearer of the BG-4?
29. LH button on sentinel
30. RH button on sentinel
31. Bypass valve
32. Inhalation valve
33. How many reinforcing rings should be on each breathing hose?
34. One
35. Two
36. Three
37. Four
38. How many icons are used to represent the capacity left in the battery?
39. One
40. Two
41. Three
42. Four
43. During mine rescue contests, blankets are an acceptable form of brattice material.
44. True
45. False
46. During mine rescue contests, it is not necessary to ventilate in front of a barricade if Nitrogen Dioxide levels are measured at 22 ppm.
47. True
48. False
49. During mine rescue contests, the \_\_\_\_ will decide whether to seal a fire in its entirety or to regulate the fire.
50. Mine manager
51. No. 1 judge
52. Mine Superintendent
53. Team
54. During mine rescue contests, a ventilation change will be considered as \_\_\_\_\_\_\_ the air current.
55. starting
56. stopping
57. redirecting
58. All of the above
59. All mine rescue team members must have completed physical examinations in the past \_\_\_ months preceding the mine rescue contest.
60. 7
61. 13
62. 12
63. 6

**2014 Northern Mine Rescue Contest**

**Findley Lake, NY**

**Written Test – Technician Team Competition – BG-4**

**ANSWER KEY**

**Q Answer Source**

1. B. False - pg. 2-6 **MSHA Publication 3027, Chapter 2**
2. A. Deficient – pg. 2-15 **MSHA Publication 3027, Chapter 2**
3. D. Explosive – pg. 2-22 **MSHA Publication 3027, Chapter 2**
4. A. Solid – pg. 2-74 **MSHA Publication 3027, Chapter 2**
5. B. False – pg. 2-23 **MSHA Publication 3027, Chapter 2**
6. C. Four - pg. 19 **Instructions for Use, 5th Edition, March 2006**
7. A. True - pg. 17 **Instructions for Use, 5th Edition, March 2006**
8. B. False - pg. 26 **BG-4** **Service Manual, 2nd Edition, July 2004**
9. A. Positive - pg. 33 **BG-4** **Service Manual, 2nd Edition, July 2004**
10. C. 2600 - pg. 53 **BG-4** **Service Manual, 2nd Edition, July 2004**
11. C. 2.5 - pg. 37 **BG-4** **Service Manual, 2nd Edition, July 2004**
12. B. 10 - pg. 13 **BG-4** **Service Manual, 2nd Edition, July 2004**
13. D. 25 - pg. 30 **Instructions for Use, 5th Edition, March 2006**
14. A. 700 - pg. 31 **Instructions for Use, 5th Edition, March 2006**
15. B. False – pg. 40 **Instructions for Use, 5th Edition, March 2006**
16. C. 140 – pg. 40 **Instructions for Use, 5th Edition, March 2006**
17. A. True – pg. 12 **Instructions for Use, 5th Edition, March 2006**
18. C. 35.7 – pg. 61 **Instructions for Use, 5th Edition, March 2006**
19. A. 9 volt – pg. 61 **Instructions for Use, 5th Edition, March 2006**
20. B. False – pg. 17 **Instructions for Use, 5th Edition, March 2006**
21. B. False – pg. 17 **Instructions for Use, 5th Edition, March 2006**
22. B. False – pg. 12 **Instructions for Use, 5th Edition, March 2006**
23. C. Bypass valve – pg. 27 **Instructions for Use, 5th Edition, March 2006**
24. C. Three – pg. 46 **Instructions for Use, 5th Edition, March 2006**
25. C. Three – pg. 57 **Instructions for Use, 5th Edition, March 2006**
26. B. False – pg. 32 **2014 MNM Contest Rules**
27. B. False – pg. 28 **2014 MNM Contest Rules**
28. D. Team – pg. 33 **2014 MNM Contest Rules**
29. D. All of the above – pg. 31 **2014 MNM Contest Rules**
30. C. Twelve – pg. 11 **2014 MNM Contest Rules**