**2014 Northern Mine Rescue Contest**

**Written Exam**

**(Technician Team – MX6)**



**2010**

**2014**

**June 17, 2014**

**Findley Lake, New York**

**2014 Northern Mine Rescue Contest**

**Findley Lake, NY**

**Written Test – Technician Team – MX6**

**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. If a CO2 sensor is present in the instrument it will be zeroed last in fresh air.
9. True
10. False
11. Oxygen deficient atmospheres may cause combustible gas readings to be lower than actual concentrations.
12. True
13. False
14. When the instrument sustains a high alarm for oxygen the gas reading is\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
15. above the high alarm
16. below the low alarm
17. A and B
18. None of the above
19. Sensor types are displayed as solid black text during normal operation, and solid red text during alarm conditions.
20. True
21. False
22. What is the recommended flow rate during calibration of the gas instrument?
23. 1.0 liters per minute (lpm)
24. 1.5 liters per minute (lpm)
25. 2.0 liters per minute (lpm)
26. 2.5 liters per minute (lpm)
27. None of the above
28. The infrared methane sensor is not to be used for methane concentrations below 5% in air.
29. True
30. False
31. A bump test measures the accuracy of the sensor.
32. True
33. False
34. The recommended calibration gas for infrared methane sensor calibration is \_\_\_\_\_\_\_.
35. 2.5% volume methane
36. 100 % volume methane
37. 5% volume methane
38. 99% volume methane
39. In a low battery situation, if the run time is less than 10 minutes, the instrument alerts the user of impending shutdown by showing \_\_\_\_\_\_\_\_\_\_\_ on the lower central part of the display.
40. Turn off
41. Battery Warning
42. Low Battery
43. Change Battery
44. Error
45. Sudden changes in atmospheric pressure may cause temporary fluctuations in the oxygen reading.
46. True
47. False
48. The data log feature saves all of the following, except ?
49. Gas type
50. Time of day
51. Temperature
52. Barometric pressure
53. Battery level
54. The measurement range for the hydrogen sulfide sensor is \_\_\_\_\_\_\_\_\_\_\_\_\_.
55. 0 to 999 ppm
56. 0 to 1,500 ppm
57. 0 to 500 ppm
58. 0 to 150 ppm
59. The instrument alarms are activated during calibration.
60. True
61. False
62. It is recommended to perform a calibration \_\_\_\_\_\_\_\_\_\_\_\_.
63. when a bump test fails
64. when exposed to over range gas concentration
65. prior to each day’s use
66. All of the above
67. A and B
68. A and C
69. Alarm event information stored in the FIFO queue includes \_\_\_\_\_\_\_\_\_\_\_.
70. Gas type
71. Fault error code
72. Peak exposure level
73. All of the above
74. A and B
75. A and C
76. The measurement range of the oxygen sensor is \_\_\_\_\_\_\_\_\_\_\_\_\_.
77. 0 to 20. 9 % Volume
78. 0 to 100 % Volume
79. 0 to 30 % Volume
80. 0 to 23 % Volume
81. The run time for the Li-ion battery pack is \_\_\_\_\_\_\_without pump and \_\_\_\_\_\_\_ with pump.
82. 24 hours and 12 hours
83. 36 hours and 12 hours
84. 24 hours and 10 hours
85. 36 hours and 10 hours
86. Bump test can be activated from the configuration-mode root menu.
87. True
88. False
89. The settings accessible from the configuration-mode root menu are\_\_\_\_\_\_\_\_.
90. Bump test
91. Alarms
92. Profiles
93. All of the above
94. A and B
95. B and C
96. The LCD backlight flashes as part of the alarm sequence for low battery condition.
97. True
98. False
99. During mine rescue contests, blankets are an acceptable form of brattice material.
100. True
101. False
102. During mine rescue contests, it is not necessary to ventilate in front of a barricade if Nitrogen Dioxide levels are measured at 22 ppm.
103. True
104. False
105. During mine rescue contests, the \_\_\_\_ will decide whether to seal a fire in its entirety or to regulate the fire.
106. Mine manager
107. No. 1 judge
108. Mine Superintendent
109. Team
110. During mine rescue contests, a ventilation change will be considered as \_\_\_\_\_\_\_ the air current.
111. starting
112. stopping
113. redirecting
114. All of the above
115. All mine rescue team members must have completed physical examinations in the past \_\_\_ months preceding the mine rescue contest.
116. 7
117. 13
118. 12
119. 6

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**ANSWER KEY**

**Q Answer Source**

1. B. False - pg. 2-6 **MSHA Publication 3027, Chapter 2**
2. A. Deficient – pg. 2-15 **(Questions 1 – 5)**
3. D. Explosive – pg. 2-22
4. A. Solid – pg. 2-74
5. B. False – pg. 2-23
6. B. False – pg. 34 **MX6 iBrid Operation Guide, Rev 7 - 1-31-2014**
7. A. True – pg. 3 **(Questions 6 – 25)**
8. C. A and B – pg. 6
9. B. False – pg. 17
10. E. None of Above (0.5 LPM) – pg. 35
11. A. True – pg. 5
12. B. False – pg. 11
13. D. 99% volume methane – pg. 5
14. C. Low Battery – pg. 33
15. A. True – pg. 4
16. D. Barometric Pressure – pg. 7
17. C. 0 to 500 ppm – pg. 39
18. B. False – pg. 34
19. E. A and B – pg. 12
20. F. A and C – pg. 7
21. C. 0 to 30 % volume – pg. 38
22. A. 24 hours and 12 hours – pg. 37
23. B. False – pg. 35
24. F. B and C – pg. 28
25. B. False – pg. 6
26. B. False – pg. 32 **2014 MNM Contest Rules**
27. B. False – pg. 28 **(Questions 26 – 30)**
28. D. Team – pg. 33
29. D. All of the above – pg. 31
30. C. Twelve – pg. 11