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:
2. Gases will diffuse more quickly
3. The atmospheric pressure is rising
4. It is much easier for explosive gases to build up
5. Gases are squeezed into a smaller area
6. Methane is most explosive at what range
7. 5% to 15% with at least 12.1% oxygen
8. 9.5% to 12.5% with at least 12.1% oxygen
9. 5% to 10%
10. 9.5% to 10%
11. Electrical malfunctions can produce oxides of nitrogen
12. True
13. False
14. Usually, the measured distance using a smoke tube is \_\_\_\_\_\_\_\_\_feet
15. 100
16. 50
17. 75
18. 25
19. Asphyxiating gases
20. Can, in all cases, be tasted, smelled, or seen
21. Cause suffocation
22. Cause the metal parts of an apparatus to corrode
23. Do not produce an oxygen deficient atmosphere
24. The explosive range of hydrogen is \_\_\_\_\_\_\_\_\_\_\_to 74.2%
25. 7%
26. 5%
27. 4%
28. 3%
29. An anemometer is a small windmill device with a mechanical counter that measures air velocities of over \_\_\_\_\_\_\_\_\_\_\_\_feet per minute
30. 100
31. 110
32. 120
33. None of the above
34. Mine ventilation air always moves from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
35. Neutral pressure regions to atmospheric pressure regions
36. Low pressure regions to high pressure regions
37. High pressure regions to low pressure regions
38. Balanced pressure regions to unbalanced pressure regions
39. A partially opened mine door can be used as a regulator
40. True
41. False
42. The most accurate measurement of air velocity using a smoke tube is obtained by releasing smoke in the center of the airway
43. True
44. False
45. Under extremely heavy work conditions, if the user inhales and collapses the diaphragm as far as it can travel, it activates the
46. By-Pass Valve
47. Demand Valve
48. Relief Valve
49. Check Valve
50. If the constant add or the demand valve fails in your apparatus, the user can still manually fill the breathing chamber by activating the
51. Emergency By-Pass Valve
52. Demand Valve
53. Relief Valve
54. Check Valve
55. If the user exhales and the breathing diaphragm/breathing chamber fills to a specified capacity, the breathing chamber will cause the activation of the
56. By-Pass Valve
57. Demand Valve
58. Relief/vent Valve
59. Check Valve
60. What specifically controls the directional flow of the breathing gasses
	1. The hoses
	2. The mask
	3. The breathing bag or chamber
	4. The CO2 scrubber/absorber
	5. The check valves
61. Typically a Closed Circuit Breathing Apparatus has
62. Cylinder or High pressure, regulated or reduced pressure, and breathing circuit or breathing loop pressure
63. Only oxygen pressure
64. Only oxygen and CO2 pressure
65. Only mask pressure
66. The function of the regulator is to
67. Increase cylinder pressure in the apparatus
68. Moisture control
69. Decrease cylinder pressure in the apparatus plumbing and pneumatics
70. A & C
71. When my CO2 absorbent is used up, the material now becomes
72. Lithium Hydroxide
73. Limestone (Calcium Carbonate)
74. Lithium Carbonate
75. Magnesium Hydroxide
76. Calcium Hydroxide
77. None of the above
78. If you hear the Demand every time you inhale, and you are not working hard, you should
79. Use the Emergency By-Pass Valve
80. Breathe slower
81. Turn off the oxygen cylinder
82. Check your facemask fit and adjust if for a better seal
83. The purpose of the CO2 absorbent is to ensure
84. Carbon Monoxide is removed from the breathing gasses
85. Carbon Dioxide is removed from the breathing gasses
86. The correct amount of Oxygen is metered out
87. The oxygen tastes good
88. Which of the following is a correct statement
89. It is acceptable to reuse CO2 absorbent
90. It is acceptable to use unapproved CO2 absorbent material in my apparatus
91. CO2 absorbent material left exposed to ambient air for 48 hours is approved for use
92. It is acceptable to store CO2 absorbent is temperatures below freezing
93. None of the above
94. Higher than normal breathing temperatures may be causes by
95. Higher than normal ambient temperatures
96. Failure to install ice canister/gel tube
97. Low working rates
98. A & B

1. During turn-around maintenance one of the NIOSH/MSHA or manufactured required tests fails. What is the best action to take
2. Ignore the failure and place the apparatus in to service, they won’t notice it
3. Troubleshoot per the manufactures requirements, document the issue and isolate the part, repair or replace or tag out the apparatus
4. Just start replacing components until the problem goes away
5. None of the above

1. 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
2. Do nothing, everyone does it and it’s not going to hurt anything, it’s just the harness
3. Scream obscenities at the guy who last used it telling him he just ruined a perfectly good harness
4. Replace or repair the harness per the manufacturer’s recommendations
5. None of the above
6. During a successful underground mission one of your team members complained of higher than normal breathing resistance. What is NOT the cause
7. Forgot to anti-fog the mask
8. Check valves are stuck
9. Hoses were crimped or crushed
10. Springs were installed incorrectly
11. All of the above
12. What BEST describes when the NIOSH/MSHA low oxygen indicator alarm activates
13. High CO2 levels
14. There is a leak
15. At 20-25% end of service life, or about 750 psi remaining pressure
16. At start up
17. The oxygen booster pump should be stored in an area free of
18. Air
19. Dirt, oils, and grease
20. Numerous ignition sources
21. Gasoline
22. All the above
23. B, C & D
24. It is an acceptable practice to store your apparatus for long term in the manufacturers hard storage case when it is
25. Clean but wet
26. Right after it has been used and wet
27. Washed/disinfected, dried and properly assembled for storage and properly benched
28. Just throw it in the case and let someone else worry about it later
29. You notice a high pressure leak on one of your oxygen fittings. Which is most correct
30. Use an oily and dirty tool
31. Work on it after it has been depressurized
32. Use the correct tool, cleaned for use around oxygen
33. Tightened beyond the manufacturers specifications to ensure it does not leak again
34. B & C
35. None of the above
36. What BEST describes Long-Term Maintenance testing
37. Delaying Turn-Around Maintenance for 30 days
38. Open the case and look it over
39. Wear it for 10 minutes and then put it away
40. Follow the manufacturer’s recommendation in the User or Benchman Manual
41. The approved NIOSH/MSHA and manufacturer rated duration of my Closed Circuit Breathing Apparatus is
42. 1-Hour
43. 2-Hour
44. Variable
45. 3-Hours
46. 4-Hours