**2012 Revised Mine Rescue Statements of Fact**

1. Rock dust is most successfully used to fight a fire by applying it by hand or by \_\_\_\_\_\_\_\_\_\_\_\_ it onto the fire. (MSHA 3028, p. 5-9)

1. sprinkling
2. pouring
3. shoveling\*
4. spraying

2. A member of a rescue team must be examined by a physician at least \_\_\_\_\_\_\_\_\_\_\_. (MSHA Part 49.17 of 30 CFR)

1. annually\*
2. bi-annually
3. quarterly
4. once a year

3. The purposes of sealing a mine fire are to \_\_\_\_\_\_\_\_\_\_\_\_ the fire to a specific area and to exclude oxygen from the fire and eventually smother it. (MSHA 3028, p. 5-6)

1. isolate
2. contain\*
3. confine
4. seclude

4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fires are “Class C” fires. (MSHA 3028, p. 5-6)

1. Combustible metal
2. Electrical\*
3. Wood
4. Petroleum product

5. One signal (pull) or “Stop” means that the rescue team wants to \_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, pp. 4-21 & 4-22)

1. retreat
2. advance
3. stop\*
4. conduct an equipment check

6. Two signals (pulls) or “Advance” means that the rescue team is going to advance move toward the \_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p. 4-21 & 4-22)

1. captain\*
2. tailman
3. fresh air base
4. injured person

7. \_\_\_\_\_\_\_\_\_\_\_\_ signals (pulls) or “Retreat” means that the rescue team is going to retreat, move toward the No. 5 person (last Person). (MSHA 3028, pp. 4-21 & 4-22)

1. One
2. Two
3. Three\*
4. Four

8. \_\_\_\_\_\_\_\_\_\_\_\_ signals (pulls) or “Distress or Emergency” means that the rescue team is in distress or emergency. (MSHA 3028, pp. 4-21 & 4-22)

1. One
2. Two
3. Three
4. Four\*

9. Team members should refrain from drinking alcoholic beverages for at least \_\_\_\_\_\_\_\_\_\_\_\_\_ hours before they get under oxygen. (MSHA 3028, p. 4-12)

1. 6 to 12
2. 12 to 18\*
3. 18 to 24
4. 24 to 36

10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ exploration should stop at any point where disruptions in ventilation are found. (MSHA 3028, p. 4-6)

1. All
2. Unprotected
3. Barefaced\*
4. SCSR

11. During \_\_\_\_\_\_\_\_\_\_\_\_\_\_, teams will work according to a rotation schedule. (MSHA 3028, p. 4-11)

1. recovery operations
2. exploration\*
3. firefighting
4. construction

12. Team members may explore in pairs (two members) providing the members of each pair shall not be more than \_\_\_\_\_\_\_\_\_\_\_\_\_\_ apart and shall be in sight of each other. (MSHA Merd guidelines, pp. 3 and 4)

1. 25 feet\*
2. 15 feet
3. 50 feet
4. 30 feet

13. The members of each mine rescue team pair shall be in constant communication with the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ who maintains constant communication with the Fresh Air Base. (MSHA Merd guidelines, p. 4)

1. captain
2. tail captain\*
3. mapman
4. command center

14. Prior to advancing, the members of each mine rescue team pair will stop at each connecting crosscut and communication will be established with all team members and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA Merd guidelines, p. 4)

1. captain
2. tail captain
3. fresh air base\*
4. command center

15. \_\_\_\_\_\_\_\_\_\_\_\_\_ consists of tiny particles of solid and liquid matter suspended in the air. (MSHA 3028, pp. 2-26)

1. Blackdamp
2. Whitedamp
3. Smoke\*
4. Float dust

16. \_\_\_\_\_\_\_\_\_\_\_\_\_ is produced by the incomplete combustion of carbon materials during fires and explosions. (MSHA 3028, p. 2-19)

1. Carbon Monoxide
2. Hydrogen\*
3. Hydrogen Sulfide
4. Methane

17. The fresh air base should be situated where it can be linked to the command center by means of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p. 4-7)

1. lifeline
2. communication system\*
3. wireless phone system
4. GPS monitoring system

18. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ must be maintained between the fresh air base and command center at all times. (MSHA Merd guidelines, p. 4)

1. Good relations
2. Communications\*
3. Dialogue
4. Conversation

19. The first indication of an explosion may be reports from miners who felt a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, notice smoke or dust or heard the sound of the explosion. (MSHA 3028, p. 5-31)

1. sudden movement of air\*
2. gust of wind
3. vibration
4. need for a hug

20. Sometimes what seems like \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is actually a major roof fall, or a rock bump or rock burst. (MSHA 3028, p. 5-31)

1. an earthquake
2. a tsunami
3. an explosion\*
4. an interruption in ventilation

21. Surface arrangements include such tasks as establishing a command center where all decisions are made, providing an adequate information center from which all public information is released, and obtaining and distributing necessary \_\_\_\_\_\_\_\_\_\_\_\_\_ and equipment. (MSHA 3028, p. 1-3, Revised 2008)

1. supplies\*
2. facts and figures
3. writing materials
4. charts and graphs

22. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are produced by burning rubber, neoprene, or polyvinyl chloride (PVC). (MSHA 3028, p. 5-17)

1. Harmful gases
2. Toxic gases\*
3. Inert gases
4. Combustible gases

23. The recommended extinguisher for mine rescue teams is a dry chemical type that contains \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p. 5-7)

1. ammonium nitrate
2. phosgene
3. monoammonium phosphate\*
4. halon

24. A monoammonium phosphate extinguisher is effective in fighting \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fires. (MSHA 3028, p. 5-7)

1. Class A and B
2. Class A, B, and C\*
3. Class A, B, C, and D
4. Class B and C

25. Foam is useful only in fighting \_\_\_\_\_\_\_\_\_\_\_\_\_\_ fires. (MSHA 3028, p. 5-11)

1. Class A and C
2. Class B and C
3. Class A and B\*
4. Class A, B and C

26. Permanent seals shall be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to protect miners from hazards related to the sealed area. (MSHA 75.335)

1. designed, constructed, and maintained\*
2. hitched into the mine roof and ribs
3. immediately installed
4. dated and initialed

27. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the term used to describe the process of assessing conditions underground and locating miners or clues to their whereabouts. (MSHA 3028, p. 4-5)

1. Communication
2. Exploration\*
3. Reconnaissance
4. Reconnoitering

28. Whenever possible, it is best to enter the mine by way of the safest \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p. 4-5)

1. unobstructed passageway
2. means
3. intake airway\*
4. point of entry

29. Barefaced exploration should be attempted only when a back-up mine rescue team with apparatus is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p. 4-6)

1. standing by
2. within shouting distance
3. immediately available\*
4. ready to deploy

30. The fresh air base is the base of operations from which the rescue and recovery teams can advance into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p. 4-6)

1. irrespirable atmospheres\*
2. contaminated atmospheres
3. unexplored areas
4. oxygen deficient atmospheres

31. When rescue teams travel in smoke, all team members should hold onto the lifeline or be linked together by means of a \_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p. 4-24)

1. lifeline
2. linkline\*
3. sound-powered communication line
4. clothes line

32. It’s recommended teams should not travel through water that is over \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (less in low coal). (MSHA 3028, p. 4-26, Revised 2008)

1. the top of their boots
2. ankle deep
3. knee deep\*
4. waist deep

33. Air courses separated by stoppings must be examined on both sides (tied in) where accessible to assure \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA Merd guidelines, p. 3)

1. systematic exploration
2. the safety of the team\*
3. all team members are "alright"
4. rapid rescue and recovery

34. Before \_\_\_\_\_\_\_\_\_\_\_\_ and traveling through any stopping inby which conditions are not definitely known, you should first erect a temporary stopping outby. (MSHA 3028, p. 4-25)

1. opening\*
2. breaching
3. examining
4. approaching

35. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the mine atmosphere for the presence of oxygen, methane, and carbon monoxide is an important element of team exploration. (MSHA 3028 p. 4-28)

1. detection
2. monitoring\*
3. examining
4. status

36. Dinner buckets encountered during exploration are important because they may contain information about the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of survivors. (MSHA 3028, p 4-29)

1. condition
2. location
3. whereabouts\*
4. health

37. A debriefing is a session held when a team returns to the surface after completing an assignment to review what they \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p. 4-33)

1. saw and did\*
2. observed and accomplished
3. examined and recorded
4. traveled to and recorded

38. The TLV-TWA is the average concentration for a normal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and a 40 hour workweek, to which workers may be repeatedly exposed, day after day, without adverse effect to a gas. (NIOSH Chemical Hazards, pp. x & xi)

1. period of exposure
2. 8 hour workday\*
3. 10 hour workday
4. shift

39. The TLV-TWA for Carbon Monoxide is \_\_\_\_\_\_\_\_\_\_\_. (NIOSH Chemical Hazards, p. 54)

1. 0.05%
2. 25 ppm
3. 50 ppm\*
4. 100 ppm

40. The STEL is a \_\_\_\_\_\_\_\_\_\_\_\_\_ TWA exposure which should not be exceeded at any time during a work day for a gas. (NIOSH Chemical Hazards, pp. x & xi)

1. 5 minute
2. 15 minute\*
3. 30 minute
4. 60 minute

41. The STEL for Carbon Monoxide is \_\_\_\_\_\_\_\_\_\_\_\_\_. (NIOSH Chemical Hazards, p. 54)

1. 20 ppm
2. 100 ppm
3. 200 ppm\*
4. 300 ppm

42. The IDLH is immediately dangerous to life or health in the event of respirator failure and one could escape within \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ without experiencing any escape impairing or irreversible health effects from a gas. (NIOSH Chemical Hazards, pp. x & xi)

1. 5 minutes
2. 15 minutes
3. 30 minutes\*
4. 20 minutes

43. The IDLH for Carbon Monoxide is \_\_\_\_\_\_\_\_\_\_\_\_\_\_. (NIOSH Chemical Hazards, P. 54)

1. 200 ppm
2. 500 ppm
3. 1200 ppm\*
4. 1500 ppm

44. Heat rises and because it is stopped by the mine roof it generates \_\_\_\_\_\_\_\_\_\_\_\_\_. (Donald W. Mitchell, MINE FIRES 3rd Edition, p. 3)

1. radiant heat
2. a cooling effect
3. forces\*
4. electricity

45. Every force creates an equal and opposite force (this leads to smoke and fire rollback and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_). (Donald W. Mitchell, MINE FIRES 3rd Edition, p. 3)

1. noxious gases
2. methane layers\*
3. oxygen deficiency
4. unstable roof conditions

46. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, pressure and volume are directly related to temperature, means the hotter the fire the higher the pressures it develops. (Donald W. Mitchell, MINE FIRES 3rd Edition p. 3)

1. The Universal Gas Law\*
2. Ohm's Law
3. Graham's Law
4. Kirchhoff's Law

47. A fire produces pressure like a fan and air always flows from the point \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ so the larger the fire the more heat and products of combustion that can be pushed back against the ventilating air towards you and the other firefighters. (Donald W. Mitchell, MINE FIRES 3rd Edition, p. 3)

1. of no return
2. of high to low pressure\*
3. of low to high pressure
4. of least resistance

48. The initial assessment is designed to help the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ detect and correct all immediate threats to life. (Brady First Responder, p. 168)

1. Emergency Care Provider
2. Emergency Medical Technician
3. EMS Technician
4. Emergency Medical Responder\*

49. Check for responsiveness by gently squeezing the patient’s shoulder and shouting, “Are you okay”. (Brady First Responder, p. 170)

1. hand
2. throat
3. shoulder\*
4. groin

50. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ patient should be transported immediately, with little time spent on the scene. (Brady First Responder, p. 175)

1. 1st priority
2. 2nd priority
3. high priority\*
4. mentally incompetent

51. Under no circumstances will the team ever \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ without orders to do so from the Command Center. (MSHA 3028, p. 3-3)

1. leave the mine
2. alter ventilation\*
3. energize power
4. breach permanent seals

52. High temperatures (or heat) cause gases to \_\_\_\_\_\_\_\_\_\_\_\_, so they diffuse more quickly. (MSHA 3028, p 2-6)

1. expand\*
2. contract
3. multiply
4. divide

53. The Command Center considers several factors before it orders a change in ventilation, most importantly; it has to consider how the alterations will affect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028 p.3-16)

1. ventilation into an unexplored area\*
2. the mine atmosphere
3. unaccounted for miners
4. explosive air mixtures

54. A \_\_\_\_\_\_\_\_\_\_\_\_ and sometimes fatal mistake that responders make is entering an unsafe or hazardous scene. (Brady First Responder, p. 165)

1. flawed
2. hasty
3. dangerous\*
4. premature

55. With the airway open place your ear over the patient’s \_\_\_\_\_\_\_\_\_\_\_\_\_, and watch for chest movement. (Brady First Responder, p. 172)

1. mouth
2. chest
3. heart
4. nose and mouth\*

56. If the patient is not breathing, check for a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to determine if blood is circulating. (Brady First Responder, p. 174)

1. femoral pulse in the thigh
2. radial pulse at the wrist
3. carotid pulse at the neck\*
4. none of the above

57. One of the first critical steps when fighting fire in a mine is to spray water (preferably as fog) \_\_\_\_\_\_\_\_\_\_\_\_\_ (inby the fire) into the path of (as close as possible to) the oncoming flames. (Donald W. Mitchell Mine Fires, p. 5)

1. inby
2. outby
3. upstream
4. downstream\*

58. Stopping smoke rollback is a must because if you cannot control the rollback you probably can’t get close enough to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (Donald W. Mitchell Mine Fires, p. 19)

1. apply fire suppressant
2. extinguish the flames
3. fight the fire effectively\*
4. put the fire out

59. Gas layering is like smoke rollback with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the likely gases to form layers during a fire. (Donald W. Mitchell Mine Fires, p. 23)

1. Oxygen and Methane
2. Methane and Carbon Monoxide
3. Methane and Hydrogen\*
4. Hydrogen and Oxygen

60. The IDLH of Carbon Dioxide is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (NIOSH Chemical Hazards, p. 52)

1. 20,000 ppm
2. 25,000 ppm
3. 40,000 ppm\*
4. 50,000 ppm

61. A smoke tube is used to show the direction and \_\_\_\_\_\_\_\_\_\_\_\_\_ of slow moving air. (MSHA 3028, pp. 3-18)

1. quantity
2. velocity\*
3. speed
4. volume

62. When taking a reading with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, a commonly used method is to traverse the airway. (MSHA 3028, p. 3-17)

1. a water gauge
2. a pitot tube
3. an anemometer\*
4. none of these

63. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ consists of two doors or two stoppings with flaps or doors in them which are in close proximity to each other in the same passageway. (MSHA 3028, p. 3-22)

1. A regulator
2. An airlock\*
3. A permanent seal
4. A fan enclosure

64. The purpose of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is to separate two different atmospheres while still permitting miners to enter and exit without mixing the atmospheres. (MSHA 3028, p. 3-22)

1. a regulator
2. a temporary stopping
3. an airlock\*
4. a permanent stopping

65. Temporary stoppings built in a crosscut should be placed at least \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into the crosscut in order that sufficient space is available to construct a permanent stopping. (MSHA 3028, p. 3-21)

1. 18 to 24 inches
2. two to four feet
3. four to six feet\*
4. three to six feet

66. “Pogo sticks” are devices which may be used to erect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p3-21)

1. airlocks
2. regulators
3. temporary stoppings\*
4. permanent stoppings

67. Oxygen is a supporter of \_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p 2-13)

1. gay marriage
2. Barack Obama
3. Mitt Romney
4. combustion\*

68. Temporary seals should include provisions for collecting air samples from within the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p 5-24)

1. mine
2. sealed area\*
3. enclosed area
4. affected area

69. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ventilation is the re-ventilation of a sealed area in successive blocks by means of airlocks. (MSHA 3028, p 7.6)

1. Positive
2. Direct
3. Progressive\*
4. Mechanical

70. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ventilation is the re-ventilation of an entire sealed area at once. (MSHA 3028, p 7-8)

1. Positive
2. Direct\*
3. Progressive
4. Mechanical

71. Sufficient time should be allowed for a fire area to cool before it is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p 7-5)

1. declared extinguished
2. unsealed\*
3. reheated
4. tested

72. Normal air has a specific gravity of \_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p 2.6)

1. one\*
2. two
3. five
4. ten

73. Besides helping you determine where to test for a gas, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ also indicates how quickly the gas will diffuse and how easily it can be dispersed by ventilation. (MSHA 3028, p. 2-7)

1. the command center
2. specific gravity\*
3. Graham's Law
4. Trickett's Theory

74. Methane is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ air. (MSHA 3028, p 2-6)

1. heavier than
2. lighter than\*
3. the same weight as
4. less explosive than

75. Carbon monoxide is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, pp 2-16)

1. noxious
2. explosive\*
3. non-explosive
4. heavier than air

76. The range of concentrations within which a gas will explode is known as its “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.” (MSHA 3028, p. 2-7)

1. expensive range
2. explosive range\*
3. danger zone
4. combustible range

77. Nitrogen dioxide has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in high concentrations. (MSHA 3028, p. 2-18)

1. a distinct odor
2. a bluish-gray color
3. a reddish-brown color\*
4. an orange color

78. Color, odor, and \_\_\_\_\_\_\_\_\_\_\_\_\_ are physical properties that can help you identify a gas, especially during barefaced exploration. (MSHA 3028 p. 2-8)

1. specific gravity
2. taste\*
3. toxicity
4. weight

79. Clean, dry air at sea level is made up of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and 21 percent oxygen. (MSHA 3028, p 2-11)

1. 75 percent nitrogen
2. 78 percent nitrogen\*
3. 79 percent nitrogen
4. 80 percent nitrogen

80. Oxygen \_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 2102, pp. 27 & 67)

1. is explosive
2. is not water soluble
3. has no odor\*
4. is flammable

81. Hydrogen sulfide has an odor similar to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p 2-20)

1. chicken
2. rotten eggs\*
3. stinkdamp
4. bananas

82. The explosive range of \_\_\_\_\_\_\_\_\_\_\_\_\_ in air is 5 to 15 volume percent. (MSHA 3028, p 2-15)

1. ethane
2. heptane
3. methane\*
4. carbon monoxide

83. When present in high concentrations (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_), carbon dioxide causes you to breathe deeper and faster. (MSHA 3028, p 2-14)

1. 1 percent or higher
2. 2 percent or higher\*
3. 3 percent or higher
4. 5 percent or higher

84. Carbon monoxide can be detected by means of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ detectors, multi-gas detectors, or by chemical analysis. (MSHA 3028, p 2-17)

1. oxygen
2. carbon monoxide\*
3. carbon dioxide
4. methane

85. The lower explosive limit of hydrogen is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p 2-19)

1. 2.0 percent
2. 4.0 percent\*
3. 4.3 percent
4. 4.5 percent

86. Hydrogen sulfide is flammable and explosive in concentrations from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ percent in normal air. (MSHA 3028, p 2-20)

1. 12.5 to 74
2. 4 to 74.2
3. 4.3 to 45.5\*
4. 5 to 15

87. Carbon dioxide is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p. 2-14)

1. non-explosive\*
2. toxic
3. flammable
4. a supporter of combustion

88. Air containing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ percent hydrogen will explode even when there is as little as 5 percent oxygen present. (MSHA 3028, p 2-17)

1. 12.5 to 74
2. 4 to 74.2\*
3. 4.3 to 45.5
4. 5 to 15

89. A mixture containing as little as \_\_\_\_\_\_\_\_\_\_\_\_\_\_ percent methane, together with coal dust, may be explosive. (MSHA 3028, p 2-21)

1. 1 to 2
2. 1½ to 2\*
3. 2½ to 3
4. 5 to 15

90. Nitrogen is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in above normal concentrations. (MSHA 3028, p 2-17)

1. toxic
2. poisonous
3. an asphyxiant\*
4. explosive

91. The IDLH of Hydrogen sulfide and Sulfur Dioxide is \_\_\_\_\_\_\_\_\_\_\_\_\_\_. (NIOSH Chemical Hazards, pp 170 & 288)

1. 100 ppm\*
2. 400 ppm
3. 500 ppm
4. 1200 ppm

92. The IDLH of Nitrogen Dioxide is \_\_\_\_\_\_\_\_\_\_\_\_\_. (NIOSH Chemical Hazards, p.228)

1. 5 ppm
2. 15 ppm
3. 20 ppm\*
4. 50 ppm

93. The affinity of carbon monoxide for hemoglobin is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ times that of oxygen. (MSHA 3028, p 2-16)

1. 100 to 200
2. 200 to 300\*
3. 200 to 400
4. 200

94. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the product of oxidation including the decay of timbers. (MSHA 3028, p 2-14)

1. Methane
2. Sulfur Dioxide
3. Carbon Dioxide\*
4. Nitrogen Dioxide

95. About \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of normal air is oxygen. (MSHA 3028, p 2-11)

1. 19.5 percent
2. 20 percent
3. 21 percent\*
4. 50 percent

96. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a mixture of carbon monoxide, carbon dioxide, methane, oxygen, nitrogen and hydrogen. (MSHA 3028, p 2-27)

1. Stinkdamp
2. Firedamp
3. Afterdamp\*
4. Normal air

97. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is usually found after a mine fire or explosion. (MSHA 3028, p 2-27)

1. Stinkdamp
2. Firedamp
3. Afterdamp\*
4. Normal air

98. Hydrogen can be detected with a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ or by chemical analysis. ( MSHA 3028, p 2-20)

1. Methane detector
2. multi-gas detector\*
3. Carbon Monoxide
4. Nitrogen

99. In some mines, carbon dioxide is liberated from the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (MSHA 3028, p 7-6)

1. the mine roof
2. the rock strata\*
3. stagnant pools of water
4. timbers

100. To detect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ teams will use an oxygen indicator. (MSHA 3028 p 2-14)

1. normal air
2. oxygen deficient atmospheres\*
3. methane
4. firedamp