Name_____

GAS DETECTION & VENTILATION TEST

_____ 1. A noxious gas is _____, however it can be dangerous if it displaces oxygen.
A. Inert
B. Explosive
C. Non-poisonous
D. Non-explosive

_____ 2. _____ gas is poisonous either by short or long term exposure.
A. A diffused
B. A combustible
C. An inert
D. A toxic

_____ 3. Specific gravity is the weight of a ratio of a specific gas compared to the same ratio of:
A. Water
B. Air
C. Oxygen
D. A vacuum

_____ 4. _____ states that the lower the specific gravity the faster it will diffuse.
A. Graham's Law
B. Boyle's Law
C. Charles' Law
D. Newton's Law

_____ 5. The Threshold Limit Value (TLV) of a gas is the amount of a gas exposure that a worker can be exposed to for _____ hours a day _____ days a week without harmful effects.
A. 12, 6
B. 10, 5
C. 8, 6
D. 8, 5

_____ 6. The Short Term Exposure Limit (STEL) is the amount of a gas that a worker can be exposed to for only:
A. 15 minutes
B. 30 minutes
C. 1 hours
D. 8 hours

_____ 7. A gas at 1% concentration diffused into an atmosphere of air would equate into _____ parts per million (PPM).
A. 10
B. 100
C. 1,000
D. 10,000

_____ 8. Pure dry air at sea level contains _____% oxygen and _____% nitrogen.
A. 16.54, 80.09
B. 19.50, 76.09
C. 20.94, 78.09
D. 78.09, 20.94

_____ 9. Pure dry air at sea level contains _____% argon and _____% carbon dioxide.
A. 19.50, 78.09
B. .03, .94
C. 20.94, 78.09
D. .94, .03

_____10. The specific gravity of air is:
A. 1.000
B. 1.105
C. .0695
D. 1.529

_____11. The specific gravity of oxygen is _____, its explosive range is _____.
A. 1.000, 5%-15%
B. 1.500, non-existent
C. 1.105, non-existent
D. 1.105, 0% to 100%

_____12. Oxygen can be detected with:
A. A flame safety lamp
B. Electronic detectors
C. Chemical analysis
D. All of the above

_____13. The minimum amount of oxygen in the mine required by law is _____%. A flame safety light will be extinguished at _____%.

A. 20.94, 15.00
B. 19.50, 16.25
C. 17.00, 16.25
D. 20.94, 17.00

_____14. Breathing and heartbeat will stop at _____% oxygen.

A. 16
B. 15
C. 11
D. 6

_____15. The specific gravity of hydrogen is _____, thus it is _____ than air.

A. .0695, lighter
B. .967, lighter
C. 1.195, heavier
D. 1.524, heavier

_____16. The explosive range of hydrogen is _____% to _____%.

A. 5, 15
B. 4.1, 74
C. 12.5, 74
D. 4.1, 100

_____17. The ignition temperature of hydrogen is between _____° F and _____° F.

A. 4.1, 74
B. 1100, 1380
C. 1100, 1130
D. 1030, 1130

_____18. Hydrogen gas is produced in a mine by:

A. Applying water to a super hot mine fire
B. Explosions
C. The charging of batteries
D. All of the above

_____19. How much oxygen is needed to perpetrate an explosion with hydrogen gas?

A. At least 19.50%
B. At least 16.25%
C. At least 15.00%
D. At least 5.00%

_____20. A mine examiner should always check battery charging stations for hydrogen gas with his flame safety lamp.

A. True
B. False

_____21. Hydrogen gas has the smell of rotten eggs.

A. True
B. False

_____22. Which method of detection should not be used for hydrogen gas?

A. The flame safety lamp
B. Electronic detectors
C. Squeeze tube detectors
D. Chemical analysis

_____23. The specific gravity of nitrogen is:

A. 78.09
B. .0695
C. 1.105
D. .967

_____24. The TLV of nitrogen is _____PPM.

A. 810,000
B. 10
C. 810
D. 5

_____25. Nitrogen gas will asphyxiate due to an oxygen deficiency.

A. True
B. False

_____26. Nitrogen gas can be detected by:

A. Its distinctive odor
B. Electronic detectors
C. Flame safety lamps
D. C, plus chemical analysis

_____27. Nitrogen gas is not found naturally in the atmosphere, but small amounts can be released from the coal seam.

A. True B. False

_____28. The specific gravity of carbon monoxide is:
A. .0695 B. 1.105
C. .967 D. 1.529

_____29. Carbon monoxide is not produced by:
A. The incomplete combustion of materials B. The charging of acid batteries
C. Fire, explosions, or blasting D. Diesel motors

_____30. What is the ignition temperature of carbon monoxide?
A. It will not ignite B. 1030° F
C. 1100° F D. 1130° F

_____31. The explosive range of carbon monoxide is from _____% to _____% with at least _____% oxygen present.
A. 5, 15, 12 B. 12.5, 74, 5
C. 12.5, 74, 6 D. 5, 15, 6

_____32. The TLV of carbon monoxide is _____PPM, the STEL is _____PPM.
A. 50ppm, 15,000ppm B. 5,000ppm, 400ppm
C. 400ppm, 50ppm D. 50ppm, 400ppm

_____33. Carbon monoxide displaces oxygen in the hemoglobin of blood.
A. True B. False

_____34. Carbon monoxide can be detected in the mine by using:
A. Electronic detectors B. Squeeze tube detectors
C. Chemical analysis D. All of the above

_____35. The specific gravity of carbon dioxide is:
A. .555 B. 1.529
C. .967 D. 2.264

_____36. Carbon dioxide has a distinct taste in high concentrations?
A. True B. False

_____37. The TLV and STEL values of carbon dioxide are:
A. 50ppm, 400ppm B. 5,000ppm, 150,000ppm
C. 50ppm, 5,000ppm D. 5,000ppm, 15,000ppm

_____38. Carbon dioxide is not produced from:
A. The oxidation of carbon & organic materials B. The exhaling of breathed air
C. Stagnant acid mine water D. The complete combustion of material

_____39. A flame safety lamp can be used to detect carbon dioxide.
A. True B. False

_____40. The chemical symbol of methane is:
A. CO_2 B. CO
C. CH_2O D. CH_4

_____41. Methane is _____ than air, its specific gravity is _____
A. Lighter, .967 B. Lighter, .555
C. Lighter, .0695 D. Heavier, 1.529

_____42. The explosive range of methane is between _____% and _____%.
A. 2, 10 B. 5, 10

C. 5, 15 D. 10, 20

_____43. _____% of oxygen is needed to burn or explode methane.
A. 6 B. 12
C. 15 D. 19.5

_____44. The ignition temperature of methane is _____° F to _____° F, depending on the humidity.
A. 1100, 1150 B. 1030, 1130
C. 1030, 1100 D. 1100, 1380

_____45. Methane is formed by the decomposition of organic matter in the presence of _____, and in the absence of _____.
A. Oxygen, water B. Carbon, oxygen
C. Water, carbon D. Water, oxygen

_____46. High concentrations of methane will have no effect on the human body.
A. True B. False

_____47. The chemical formula for hydrogen sulfide is:
A. H_2S B. H_2S_2
C. HS_2 D. HS_4

_____48. Another name for hydrogen sulfide is:
A. Black damp B. White damp
C. Stink damp D. Fire damp

_____49. Hydrogen sulfide has a bitter taste and a smell of rotten eggs.
A. True B. False

_____50. Hydrogen sulfide has an ignition temperature of _____° F; _____% oxygen is needed to ignite it.
A. 1100, 6 B. 1380, 12
C. 700, 0 D. 1030, 5

_____51. Hydrogen sulfide has a TLV of _____PPM and a STEL of _____PPM.
A. 150ppm, 10,000ppm B. 5,000ppm, 15,000ppm
C. 500ppm, 400ppm D. 10ppm, 15ppm

_____52. The explosive range of hydrogen sulfide is between _____% and _____%.
A. 4.3, 45 B. 4.1, 74
C. 5, 15 D. 2.4, 83

_____53. Hydrogen sulfide will cause paralysis of the _____ system after only a few inhaled breaths.
A. Respiratory B. Olfactory
C. Nervous D. Circulatory

_____54. Which is not a source of hydrogen sulfide gas?
A. Gob fires B. Rotting mine timbers
C. Stagnant acid mine water D. Blasting of some sulfide ores

_____55. Hydrogen sulfide can be smelled in minute concentrations.
A. True B. False

_____56. The chemical formula for nitrogen dioxide is:
A. NO B. NO_2
C. N_2O_2 D. NO_2

_____57. Nitrogen dioxide has an odor of rotten eggs.
A. True
B. False

_____58. The specific gravity of nitrogen dioxide is:
A. .555
B. 1.589
C. .9107
D. 1.529

_____59. Nitrogen dioxide has an orangish, yellow color in high concentrations.
A. True
B. False

_____60. Nitrogen dioxide is produced by:
A. Blasting
B. Diesel engines
C. Electric arc welding
D. All of above

_____61. The ignition temperature of nitrogen dioxide is:
A. 1030° F
B. 1130° F
C. 1180° F
D. It will not ignite

_____62. Nitrogen dioxide has a TLV of _____PPM and a STEL of _____PPM.
A. 50ppm, 400ppm
B. 5,000ppm, 15,000ppm
C. 5ppm, 10ppm
D. 10ppm, 50ppm

_____63. Nitrogen dioxide forms nitric acid when it comes in contact with _____ causing _____.
A. The blood's hemoglobin, heart failure
B. The central nervous system, a loss of consciousness
C. The skin, a severe rash
D. The mucus membranes & respiratory system, pulmonary edema

_____64. Nitrogen dioxide can be detected with all of the following except:
A. A squeeze tube detector
B. A flame safety lamp
C. Chemical analysis
D. Electronic detector

_____65. The chemical symbol for sulfur dioxide is:
A. S_2O_4
B. SO_2
C. SO_4
D. $S_2H_3O_2$

_____66. Sulfur dioxide has:
A. A strong sulfur odor
B. A smell of rotten eggs
C. A smell of burnt gunpowder
D. No detectable odor

_____67. Sulfur dioxide has a slight sweet taste.
A. True
B. False

_____68. The specific gravity of sulfur dioxide is:
A. 1.589
B. 1.191
C. 2.264
D. .9107

_____69. What is not a source of sulfur dioxide?
A. Stagnant mine water
B. The burning of sulfide ores
C. Diesel fumes
D. Gob fires

_____70. Sulfur dioxide has an extremely low ignition temperature.
A. True
B. False

_____71. Sulfur dioxide is harmful to the body, it will create sulfuric acid in the mucus membranes causing pulmonary edema.
A. True
B. False

2. Sulfur dioxide can be detected with:
A. Electronic detectors
B. Squeeze tube detectors
C. Chemical analysis
D. All of the above

3. What is the chemical formula for acetylene.
A. CH_4
B. C_2H_2
C. C_2H_4
D. C_4H_2

4. Which best describes the odor of acetylene?
A. A garlic aroma
B. A strong sulfur odor
C. An odor of rotten eggs
D. No detectable odor

5. Acetylene has a specific gravity of:
A. 2.264
B. 1.529
C. .967
D. .9107

6. How is acetylene formed?
A. Methane is heated or burned in a low oxygen atmosphere
B. Methane is heated or burned in a high oxygen atmosphere
C. Methane is mixed with hydrogen in the presence of oxygen
D. Methane is mixed with hydrogen in the absence of oxygen

7. The explosive range of acetylene is _____% to _____%.
A. 5, 15
B. 4.1, 74
C. 2.4, 83
D. 12.5, 74

8. The ignition temperature of acetylene is _____° F.
A. 518
B. 581
C. 555
D. 1018

9. Acetylene will asphyxiate due to the displacement of oxygen.
A. True
B. False

0. The word 'damp' as used in mining, is derived from the German word 'damph' meaning gas or air.
A. True
B. False

1. _____ damp is carbon dioxide and nitrogen in an oxygen-deficient atmosphere which will cause suffocation.
A. White
B. Fire
C. Black
D. Stink

2. White damp is another name for:
A. Methane
B. Hydrogen sulfide
C. Carbon dioxide
D. Carbon monoxide

3. Methane gas is also known as _____ damp.
A. After
B. Fire
C. Black
D. White

4. The gas products of a mine explosion are known as:
A. Black damp
B. Fire damp
C. After damp
D. Stink damp

5. Nitric oxide with a chemical formula of _____ has a TLV of _____PPM.
A. NO_2, 40
B. N_2O_2, 25
C. NO_1 25
D. NO_4, 20