

TECHNICIAN TEAM WRITTEN TEST
Industrial Scientific Corporation Gas Instruments, Rule Book
And Modules 2 and 3
Rock Springs, Wyoming – June 8, 2010 (BG4)

Name: _____ **Company:** _____

Team Name: _____ **Contest Position Number:** _____

Directions: Make sure you place your answer on the answer sheet.

1. Which of the following substance(s) may cause readings of the combustible gas sensor to be lower than actual gas concentrations?

- A. Hydrogen
- B. Benzene
- C. Silicone
- D. All of the Above
- E. None of the Above

2. A functional (bump) test is defined as _____

- A. a brief exposure of the monitor (gas instrument) to a known concentration of gas(es)
- B. to verify sensor operation
- C. to verify alarm operation
- D. all of the above
- E. none of the above

3. Verify the calibration of the combustible gas sensor after any incident where the combustible gas content has caused the gas instrument to display an OVER-RANGE (alarm) condition.

- A. True
- B. False

4. Obstruction of the sensor aperture areas and/or contamination of the water barriers may cause readings to be _____ than actual gas concentrations.

- A. higher
- B. the same
- C. lower

5. The gas instrument measures nitrogen dioxide in _____ increments.

- A. 0.01 PPM
- B. 0.1 PPM
- C. 1 PPM
- D. 0.1 PPB

6. In non-latching mode for the gas instrument, all high alarm conditions (and not in Over Range condition) will clear or turn off automatically when the gas concentration has decreased to a level below the high alarm setpoint.

- A. True
- B. False

7. Prior to entering the normal GAS READING mode during start-up, the gas instrument will display all installed sensor types.

- A. True
- B. False

8. During calibration, what is the recommended flow rate?

- A. 2.0 liter per minute (LPM)
- B. 2.5 liter per minute (LPM)
- C. 3.0 liter per minute (LPM)
- D. 4.0 liter per minute (LPM)
- E. none of the above

9. If the sensor's full span value or span reserve is less than _____ of the applied (calibration) gas value\concentrations, the sensor will fail calibration.

- A. 30%
- B. 50%
- C. 70%
- D. 90%
- E. 100%

10. For the purposes of contest work, no barricade will be entered without ventilating in front of the barricade if _____

- A. Oxygen (O₂) is below 17.0%
- B. Carbon Monoxide (CO) exceeds 1200 ppm
- C. Nitrogen dioxide (NO₂) exceeds 5 ppm
- D. All of the above
- E. Only A and B

11. The mine fan(s) can create [a] pressure differential either by blowing air into the mine or exhausting air from the mine.

- A. True
- B. False

12. The basic principle underlying mine ventilation is that air always moves from low pressure regions to high pressure regions.

- A. True
- B. False

13. Porous stoppings such as concrete block stoppings are usually plastered _____ to reduce air leakage.

- A. low-pressure side
- B. high-pressure side
- C. both sides
- D. none of the above

14. Mine doors are _____

- A. used to keep air flowing in a mine passage.
- B. used to vacillate separate splits of air.
- C. always hung so that the ventilation pressure will push them open.
- D. Both A and B
- E. none of the above

15. The line brattice can be installed by erecting posts or supports with boards along the back to which the brattice can be attached.

- A. True
- B. False

16. Firefighting with water or foam can not produce hydrogen.

- A. True
- B. False

17. Which of the following is not a property of carbon dioxide?

- A. Will neither burn or explode
- B. Has a specific gravity of 1.5 (rounded to the nearest tenth)
- C. Is colorless and odorless
- D. Normal air contains about 0.3 percent of carbon dioxide

18. Hydrogen sulfide is one of the most poisonous gases known.

- A. True
- B. False

19. Ethane is often detected along with methane in mines that have methane and like methane is much lighter than air.

- A. True
- B. False

20. Smoke is not normally considered to be an asphyxiant.

- A. True
- B. False

21. When checking the minimum valve the admission pressure of the minimum valve must be between _____ and _____ mbar?

- A. 0.5 and 2.0
- B. 0.1 and 1.5
- C. 1.0 and 2.5
- D. 0.1 and 2.5

22. Dosage output is 1.5 to 1.9 PSI?

- A. True
- B. False

23 The mission must always be ended when the low-pressure warning output is at approximately 135 psi?

- A. True
- B. False

24. The carbon cylinder has a life span of _____ years?

- A. 5
- B. 10
- C. 15
- D. 20

25. On the relief valve, the over pressure valve opens between 2-5 mbar?

- A. True
- B. False

26. A leak in the dosage line can cause low dosage?

- A. True
- B. False

27. Carbon monoxide contained in the exhaled air **is** absorbed in the regeneration cartridge?

- A. True
- B. False

28. When installing a relief valve, turn relief valve 45 degrees to the left?

- A. True
- B. False

29. High pressure O₂ cylinders contain _____% O₂?

- A. 96.5
- B. 97.5
- C. 98.5
- D. 99.5

30. When checking the inhalation valve for control function; the pressure gauge must indicate +10 psi?

- A. True
- B. False