

2010 Metal/Nonmetal Mine Rescue Contest
TECHNICIAN TEAM WRITTEN TEST-BG4

1. Oxygen deficient atmospheres may cause readings of combustible (methane) gas to be _____ than actual concentrations.

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

2. Which of the following may cause the combustible gas sensor to read lower than actual gas concentrations?

- A. Silicone compound vapors
- B. Oxygen enriched atmospheres
- C. Sudden changes in atmospheric pressure
- D. all of the above
- E. only A and C

3. Sudden changes in atmospheric pressure may cause temporary fluctuations in the _____ reading.

- A. Carbon monoxide
- B. Methane
- C. nitrogen dioxide
- D. oxygen
- E. all of the above

4. When the gas instrument is in the normal operating\gas viewing mode, each segment (TMX412) or shaded area (ITX) of the battery status indicator represents approximately _____ of operating time.

For TMX412:

- A. 15 minutes
- B. 30 minutes
- C. 1 hour
- D. 10%

For ITX

- A. 5%
- B. 10%
- C. 25%
- D. 30 minutes

5. With the exception of _____ gas over-range, all over-range conditions will clear automatically when the gas concentration has decreased to a level within the display range of the gas instrument in non-latching mode.

- A. carbon monoxide
- B. nitrogen dioxide
- C. combustible
- D. oxygen
- E. None of the above

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

- A. True
- B. False

7. The oxygen sensor will calibrate to room (clean) air at _____

- A. 20.0%
- B. 20.5%
- C. 20.9%
- D. 23.0%

8. According to the manufacturer's recommendation, how often should the gas instrument be calibrated?

- A. Before each day's use
- B. When gas instrument shows a noticeable loss of sensor sensitivity
- C. Once a week
- D. Once a month

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

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

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

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

From MSHA Publication 3027 Modules 2 and 3: (Revised 2008)

11. It is important to “control” and “course” air underground so that it reaches only the area miners are working.

- A. True
- B. False

12. A person can tolerate concentrations of $\frac{1}{2}$ of 1 percent CO₂ over an 8-hour daily period without harmful effects.

- A. True
- B. False

13. Its much easier for concentrations of explosive gases to build up when the barometric pressure is high.

- A. True
- B. False

14. Air containing 4 to 74.2 percent hydrogen will explode even when there is as little as 5 percent oxygen present.

- A. True
- B. False

15. Porous stopping's 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

16. Mine doors are _____

- A. used to keep air flowing in the travel way.
- B. used to vacillate separate splits of air.
- C. always hung so that the ventilation pressure will push them open.
- D. all of the above
- E. none of the above

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

- A. True
- B. False

18. 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

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 asphyxiate.

- A. True
- B. False

BG 4 Questions

21. The panorama Nova mask is tested with negative pressure.

- A. True
- B. false

22. The temperature for drying parts must not exceed 60 degrees C.

- A. True
- B. false

23. Both the blue and yellow lines are high pressure from the reducer.

- A True
- B. False

24. One of the causes of incorrect dosage can be cylinder pressure is incorrect.
A. True
B. false
25. A carbon cylinder holds 2 quarts of compressed oxygen.
A. True
B. False
26. Aviator grade oxygen can be used to fill the cylinder.
A. True
B. False
27. Permissible impurities in depressurized gas, Maximum water vapor concentration are 50 mg/m³.
A. True
B. False
28. Maximum drying temperature is _____ degrees F.
A. 120
B. 114
C. 140
D. 130
29. A leak in the dosage line can cause high dosage.
A. True
B. false
30. When the low pressure warning occurs, _____% of oxygen has been used up.
A. 25
B. 75
C. 95
D. 5