



2011 Central Mine Rescue Contest

May 19-20, 2010

Juneau, Alaska

Written Exam ~ Team Tech.

All tests must be completed within a total of 60 minutes

Name _____ Company _____

Team Name _____ Contest Position No. _____

Team Member No. _____

Directions: Write the correct letter on the blank space provided at the right.

BG4 Breathing Apparatus:

1. What are the types of BG4 testing? _____
A. Quick electronic operational check
B. Portable test kits
C. Dynamic bench tester
D. All above
2. The temperature for drying parts must not exceed 60 degrees C. _____
A. True B. False
3. Both the blue and yellow lines are high pressure from the reducer? _____
A. True B. False
4. One of the causes of incorrect dosage can be cylinder pressure is incorrect? _____
A. True B. False
5. To check the exhalation valve, the Rz must be set on negative pressure? _____
A. True B. False
6. Aviator grade oxygen can be used to fill the cylinder? _____
A. True B. False
7. Permissible impurities in depressurized gas: Max. water vapor concentration: 50 mg/m³ _____
A. True B. False
8. Max drying temperature is ____ degrees F . _____
A. 120
B. 114
C. 140
D. 130

9. A leak in the dosage line can cause high dosage _____
A. true B. False
10. When the last low pressure warning occurs, _____ % of oxygen has been used up. _____
A. 25
B. 75
C. 95
D. 5

iTX Gas Instrument:

11. Oxygen enriched atmospheres may cause readings of combustible (methane) gas to be _____ than actual concentrations. _____
A. higher
B. the same
C. lower
12. Silicone compound vapors may cause readings of combustible gas to be lower than actual gas concentrations. _____
A. True B. False
13. Solvents or cleaning solvents can be used to clean the outside of the iTX instrument. _____
A. True B. False
14. With a minimum of _____ of battery life remaining, the iTX unit will emit a periodic tone alerting the user to charge/replace the battery. _____
A. 5 minutes
B. 15 minutes
C. 30 minutes
D. 1 hour
15. Under the specifications of the manual, the iTX will have a run time of _____ under the following conditions:
a fully charged Li-ion pack; all sensors installed; room temperature;
no alarms activated; and without a parasitic pump. _____
A. 10 hours
B. 15 hours
C. 20 hours
D. 24 hours

16. For calibration, any gas sensor with a full span value greater than _____ of the calibration gas value will show PASS. _____

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

17. 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

18. 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

19. Verify the calibration of the combustible gas sensor after any incident where the combustible gas content has caused the instrument to latch in the OVER-RANGE (alarm) conditions. _____

- A. True
- B. False

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

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

MSHA Publication 3027 Modules 2 and 3:

21. The presence of small quantities of hydrogen (H₂) has little effect on the explosive range of other gases. _____

- A. True
- B. False

22. Exposure to an atmosphere containing 15% oxygen will cause dizziness and headaches. _____

A. True B. False

23. Which of the following gases is not toxic? _____

- A. Oxides of Nitrogen
- B. Carbon Dioxide
- C. Acetylene
- D. All of the above

24. The specific gravity of Nitrogen Dioxide (NO_2) is _____. _____

- A. 1.7493
- B. 2.0756
- C. 1.5894
- D. 2.9153

25. An anemometer actually measures _____ of air. _____

- A. linear feet of travel
- B. quantity
- C. velocity
- D. all of the above

Metal and Nonmetal Mine Rescue Contest
Kellogg, Idaho - 2010
ANSWERS for the TECHNICIAN TEAM WRITTEN TEST

BG4 Breathing Apparatus:

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|----|---|-------|
| 1 | D | pg 64 |
| 2 | B | pg 45 |
| 3 | B | pg 44 |
| 4 | A | pg 41 |
| 5 | A | pg 36 |
| 6 | A | pg 28 |
| 7 | A | pg 28 |
| 8 | C | pg 27 |
| 9 | B | pg 28 |
| 10 | C | pg 13 |

iTX Gas Instruments:

- | | | |
|----|---|---|
| 11 | A | Manual (rev 6), page 3 |
| 12 | A | Manual (rev 6), page 3 |
| 13 | B | Manual (rev 6), page 27 |
| 14 | B | Manual (rev 6), page 27 |
| 15 | D | Manual (rev 6), page 29 |
| 16 | C | Manual (rev 6), page 25 |
| 17 | D | Manual (rev 6), page 3 |
| 18 | D | Manual (rev 6), page 23 |
| 19 | A | Manual (rev 6), page 3 |
| 20 | C | iTX on-line Calibration Training Video, Slide 8 |

MSHA Publication 3027 Modules 2 and 3:

- | | | |
|----|---|------------------|
| 21 | B | Module page 2-18 |
| 22 | A | Module page 2-14 |
| 23 | B | Module page 2-28 |
| 24 | C | Module page 2-17 |
| 25 | A | Module page 3-16 |