

2010 Central Mine Rescue Contest

May 14-15, 2010

Kellogg, Idaho

Technician Team Written Exam

All tests must be completed within a total of 60 minutes

Name: _____ Company: _____

Team Name: _____ Contest Position Number: _____

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 (NO₂) 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

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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
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