

Southwest Wyoming Mutual Aid Mine Rescue Contest
Rock Springs WY
June 10-12, 2014

DRAEGER BG4 Technician Team Test

Company Name _____

Team Name _____

Name _____

1. MSHA requires mine rescue stations serving underground M/NM mines to have six gas detectors appropriate for each gas which may be encountered at the mines served.

- a) True
- b) False

2. In addition, gas detectors must measure concentrations of methane from 0.0 percent to 100 percent of volume, oxygen from 0.0 percent to at least 20 percent of volume, and carbon monoxide from 0.0 parts per million to at least 9,999 parts per million.

- a) True
- b) False

3. The volume of a gas changes in response to any change in atmospheric pressure or temperature. For example: An increase in temperature causes a gas to contract.

- a) True
- b) False

4. The specific gravity of normal air is _____?

- a) 1.5
- b) 2.0
- c) 1.0
- d) 1.5

5. Sulfur dioxide, for example, has a specific gravity of 2.2638.
- a) 2.2635
 - b) 2.2638
 - c) 2.2538
 - d) 2.3838
6. The explosive range of hydrogen, for example, is ___ to ___ percent in the presence of normal air.
- a) 3.0 to 75.2
 - b) 5.0 to 76.3
 - c) 4.0 to 72.2
 - d) 4.0 to 74.2
7. In order to get the air to flow from the intake to the exhaust, the exhaust air must be at a higher pressure than the intake.
- a) True
 - b) False
8. Bulkheads are used to direct air to where it is needed and to keep intake air from short circuiting to the exhaust before it reaches the working area.
- a) True
 - b) False
9. Check curtains are used to deflect the exhaust air current into a working area.
- a) True
 - b) False
10. Any teams working beyond the established time period will be notified by the #2 Judge that they must leave the field.
- a) True
 - b) False

11. Charging the Oxygen Cylinder, Permissible impurities in depressurized gas:
Max. water vapor concentration: ____ mg/m³.

- a) 45
- b) 60
- c) 55
- d) 50

12. Fitting the Oxygen Cylinder The cylinder must be full for operational usage,
____ PSI (206 BAR) is required.

- a) 2500
- b) 2000
- c) 3000
- d) None of the above

13. Testing the PSS BG 4 with Inserted CO₂ Absorber Exceptionally, if the
breathing circuit is opened for more than 10 minutes, the CO₂ absorber
apertures should be sealed with three PE plugs to prevent escape of gas.

- a) True
- b) False

14. Low Pressure Warning Indication – Backlight turns on including red LED

- a) True
- b) False

15. Checking the Exhalation Valve 1 Set “negative pressure pumping”. 2 Tightly
pinch the inhalation hose with your hand. 3 Pump once until ____ mbar is
indicated on the pressure gauge.

- a) -15
- b) -5
- c) -8
- d) -10

16. Leak Test with Positive Pressure 1 Set “Leak test” 2 Press the button to
reduce the pressure to 7 mbar. . Start the stopwatch. The pressure must not
change by more than ____ mbar during one minute.

- a) 2
- b) 3
- c) 1.5
- d) 1

17. High-Pressure Leak Test 1 Set "Leak test". 2 Open the cylinder valve. 3 Watch the Sentinel: the cylinder pressure is indicated here. If cylinder pressure is lower than 2500 psi / 180 bar: Charge the oxygen cylinder.

- a) True
- b) False

18. When Checking the Minimum Valve Watch the pressure gauge: the minimum valve should open at a value between ___ and ___ mbar.

- a) 0.2 and 2.5
- b) 0.1 and 2.5
- c) 0.1 and 2.0
- d) None of the above

19. Checking the Residual Pressure Warning • Close the cylinder valve. 1 Watch the Sentinel. A warning should be generated at approximately ___ psi / ___ bar. The acoustic alarm sounds intermittently and the red LEDs flash.

- a) 500 psi / 50 bar
- b) 600 psi / 45 bar
- c) 700 psi / 48 bar
- d) None of above

20. Symbol "Battery warning 2"– In this case the red LEDs flash constantly. On Power up 5 short beeps will sound and the display will show the "Battery warning 2" icon. Sentinel automatically powers off and blocks any further operation.

- a) True
- b) False

21. If a battery warning 2 is displayed, the battery must be re-charged before any new operation.

- a) True
- b) False

22. Switching Off the Sentinel • Simultaneously press the right and left hand button until a single sharp audible “bleep” sounds. • Release buttons.

• For ___ seconds Sentinel shows the battery status. • Sentinel switches off.

- a) 5
- b) 10
- c) 6
- d) 3

23. The O ring on plug –in coupling should be replaced ____ when in constant use.

- a) Every 3 years
- b) Half yearly
- c) Yearly
- d) Every 5 years

24. The Major Component Groups for the BG4 are Pneumatics, Face cover, Sentinel System, and Case & Harness.

- a) True
- b) False

25. BG 4 High Pressure O2 Cylinders • Steel cylinder is hydrotested at ___ year intervals

- a) 2
- b) 3
- c) 5
- d) 4

26. BG 4 Minimum Valve • Activates between .1 and 2.5 mbar

- a) True
- b) False

27. BG 4 Minimum Valve • Provides approximately ____ l/min flow

- a) 50
- b) 40
- c) 75
- d) 80

28. BG 4 Breathing Hoses • EPDM hose material • half turn connectors • Single style hose • Anti-crush rings

- a) True
- b) False

29. BG 4 Relief Valves • Two sealing valves installed Moisture trap valve Over pressure relief • Components identical • Over pressure valve opens between ____ mbar • Moisture trap opens ≥ 15 mbar

- a) 1-4
- b) 3-6
- c) 1-5
- d) 2-5

30. BG 4 Breathing Bag • ____ Liter volume • Sealed seams • Polyurethane / yellow

- a) 4.0
- b) 5.5
- c) 4.5
- d) 5.0