

2024 Nevada Mine Rescue Contest: Technician Written Exam

- Oxygen-enriched atmospheres may cause combustible gas readings to be ____ actual concentrations.
 - Higher than (MX6 Manual page 4)
 - Lower than
 - The same as
- The IR (infrared) methane sensor reading is not to be used for methane concentrations below ____ in air.
 - 10%
 - 3%
 - 5% (MX6 Manual page 6)
- The High Level audio gas alarm consists of _____.
 - Low frequency beeps with a long delay
 - High frequency with short delay (MX6 Manual page 6)
 - Low frequency with short delay
- The confidence indicator blinks the LEDs once every ____ seconds.
 - 30 (MX6 Manual page 7)
 - 45
 - 60
- How many error events for the instrument are recorded into a FIFO queue in nonvolatile memory and are time stamped?
 - 20
 - 15 (MX6 Manual page 8)
 - 10
- When the low battery display (shown below) appears, the battery life remaining is _____.
 - Less than 30 minutes
 - Less than one hour (MX6 Manual page 20)
 - Less than 15 minutes
- If there is a CO₂ sensor present in the instrument, it is zeroed _____.
 - First
 - In the middle of calibration
 - Last (MX6 Manual page 36)
- During calibration, gas should be applied at a flow rate of ____ lpm.
 - 0.25
 - 0.5 (MX6 Manual page 37)
 - 1.0
- What is the acceptable temperature range for normal operating conditions?
 - 4 °F to +131 °F (MX6 Manual page 42)
 - 0 °F to +120 °F
 - 40 °F to +131 °F

O ₂	PID	SO ₂
20.9	0.0	0.0
%vol	ppm	ppm
H ₂ S	CO	LEL
0.0	0	0
ppm	ppm	%LEL
Low Battery		16:54

10. Industrial Scientific recommends that infrequently used lithium-ion batteries be fully charged every ____ months.
- 12
 - 6
 - 4 (MX6 Manual page 42)
11. Air samples taken from behind sealed areas of the mine are analyzed to determine when it's safe to begin ____ work.
- Exploration
 - Rescue
 - Recovery (3027 2-4)
12. When barometric pressure falls, the pressure on the gas is ____.
- Reduced (3027 2-6)
 - Increased
 - Unchanged
13. Clean, dry air at sea level is made up of ____ percent nitrogen and ____ percent oxygen.
- 80, 20
 - 78, 21 (3027 2-12)
 - 75, 24
14. Breathing air containing 5 percent carbon dioxide increases respiration ____ percent, causing difficult breathing.
- 300 (3027 2-15)
 - 250
 - 200
15. Hydrogen Sulfide is most explosive at ____ percent.
- 12.4
 - 45.5
 - 14.2 (3027 2-19)
16. ____ is a very toxic, irritating gas that is dangerous even in small concentrations, as little as 0.04 to 0.05 percent (400 to 500 ppm) is dangerous to life.
- Carbon Monoxide
 - Sulfur Dioxide (3027 2-21)
 - Hydrogen Sulfide
17. The explosive range of Acetylene in normal air is ____ percent.
- 2.5-80 (3027 2-24)
 - 5-15
 - 2.2-9.35
18. ____ has a "sweetish" taste
- Sulfur Dioxide
 - Radon
 - Hydrogen Sulfide (3027 2-20)

19. This is a mixture of carbon monoxide, carbon dioxide, methane, oxygen, nitrogen, and hydrogen.
- Whitedamp
 - Afterdamp (3027 2-27)**
 - Blackdamp
20. ____ is a mixture of carbon dioxide, nitrogen, and air.
- Firedamp
 - Stinkdamp
 - Blackdamp (3027 2-27)**
21. ____ ventilation is rarely used in mines because the pressure differential is usually not great enough to create a sufficient and steady flow of air through the mine.
- Upcast
 - Mechanical
 - Natural (3027 3-5)**
22. A “parachute stopping” is considered to be a ____?
- Temporary bulkhead (3027 3-9)**
 - Check curtain
 - Permanent bulkhead
23. ____ are usually built with concrete block walls sealed against the sides and floor, and with some type of airtight roof made of pre-stressed concrete, railroad ties, or steel beams.
- Undercasts
 - Overcasts (3027 3-11)**
 - Mine doors
24. For measurements of high velocities encountered in flowing ducts or tubing, a ____ can be inserted through a small hole in the duct or tubing.
- Smoke tube
 - Anemometer
 - Pitot tube (3027 3-16)**
25. A medium-velocity (or “regular”) anemometer is for measuring velocities from ____ feet per minute.
- 120-2,000 (3027 3-16)**
 - 1500-5,000
 - 2,000-10,000
26. The anemometer should be raised and lowered as you walk to the opposite side so that the ____ velocity of the air is measured.
- Total
 - Average (3027 3-17)**
 - Corrected
27. Velocity is always measured in ____.
- feet per minute (3027 3-19)**
 - cubic feet per minute
 - feet per second
28. When installing a temporary bulkhead in a passageway, particularly in a crosscut of a room-and-pillar, single-level mine, the bulkhead should be erected a sufficient distance

into the passageway (at least _____) to permit enough room for a permanent bulkhead to be built later.

- a. 2 to 3 feet
 - b. 3 to 5 feet
 - c. 4 to 6 feet (3027 3-22)
29. In many mines during a rescue and recovery operation, _____ are put up to establish a fresh air base and enable teams to move forward into questionable air without contaminating the air at the fresh air base.
- a. Permanent bulkheads
 - b. Air locks (3027 3-23)
 - c. Line brattice
30. Spring-loaded expandable metal rods that can be used instead of posts to erect temporary bulkheads are called _____.
- a. Pogo sticks (3027 3-22)
 - b. Timbers
 - c. Posts