Rolla
Team Technician Test
BIO apparatus
ISC gas detector

1. During an entry your team wore the apparatus for 45 minutes and came out of the mine and doffed the apparatus. The team replaced their oxygen cylinders with new cylinders that were completely full. They replaced their ice. Select the **BEST** answer below:
   A. Smart thing, we always need extra oxygen.
   B. Change the ice? Our team is in great shape and don't need no stinking ice.
   C. If I change out my cylinder I must change out my scrubber as well, otherwise my O2 will outlast my CO2 scrubber and I could get high levels of CO2

2. I'm just training so I can use my apparatus without any gel tube/ice canister and I can reuse old CO2 scrubber
   A. Sure, I'm a Benchman and I can do it all.
   B. Do, what? Follow both NIOSH/MSHA and the manufacturers requirements in the manual
   C. Who needs manuals
   D. It's OK as long as I'm not going underground

3. You just returned from vacation. You find your teams apparatus neatly stacked on the floor of the Mine Rescue Room without any tags. Several new trainees come in and tell you they are supposed to get some O2 time and need to wear the apparatus. You…….
   A. Tell them go for it and you sit back and watch them don the apparatus.
   B. They look clean, so you allow them to wear them.
   C. You visually inspect them and they appear OK so you let them wear them.
   D. You can't find any evidence of them being benched so you tell them they will have to wait until you bench each one.

4. You are preparing your teams apparatus for a contest. You are getting the CO2 scrubber ready and the Keg/Canisters <u>do not have any factory markings or dates on them</u>. Select the best answer:
   A. They look OK, you see no damage but they have been opened. You go ahead and use them, it's only a contest.
   B. Upon further inspection, it looks and smells OK so you use it anyway.
   C. It's too much of a risk; you find CO2 scrubber material that has the proper dates.
   D. I ask my captain and he tells me to use it anyway.

5. You are the team Benchman. The team captain asks you to Bench his apparatus while he attends the captains meeting. You get distracted and forget to put CO2 scrubber in the apparatus. Subsequently the captain goes out on the field and after 3 minutes collapses. Chose the best answer:
   A. You feel bad but it's ultimately his responsibility to ensure his apparatus is ready.
   B. The captain made you work overtime without pay so he deserves it any way.
   C. While the benchman should not have gotten distracted, the user should have checked his apparatus
   D. Both A and C

6. You are training some **very new** team members. They are about to bench their apparatus and get ready to go under oxygen in a controlled environment, NOT underground. You get a phone call and leave the room. When you return they all have the apparatus donned with the exception of the mask and turning on the oxygen. At a minimum what items should you check before they go under oxygen? These units were recently benched and passed their monthly checks. Choose the BEST answer.
   A. Nothing let them learn the hard way.
   B. I'd physically check to ensure they had fresh CO2 scrubber, ice canisters or gel tube and oxygen in the cylinders and watch them do the check valve positive/negative check
   C. Ask them if they did everything right, and let them go.

7. When it comes to lubrication of O-rings in my apparatus, which statement is <u>most</u> true:
   A. Use any lubricant
   B. Use a lot of lubricant
   C. Use only the lubricants approved by the manufacturer
   D. I never lubricate

9. The purpose of the regulator is to:
   A. Boosts the pressure from the oxygen cylinder to the other components in the apparatus
   B. Lowers the pressure of the oxygen as it flows to the other components in the apparatus
   C. Monitors the amount of moisture in the oxygen
   D. Provides for positive pressure in the apparatus

10 If Positive Pressure could be attributed to ONLY ONE component in the apparatus what would it be:
   A. The spring(s)
   B. The breathing chamber
   C. Oxygen pressure
   D. Bypass

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 nitrogen dioxide gas to be lower than gas concentrations.

A. True
B. False

13. 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

14. A functional ("bump") test is defined as _____

A. a long exposure of the monitor (gas instrument) to a known concentration of gas(es)
B. a non-verification of sensor and alarm operation
C. intended to be a measure of the accuracy of the instrument
D. only A and C
E. none of the above

15. During calibration, what is the recommended flow rate?

A. 2.0 liter per minute (LPM)
B. 2.5 liter per minute (LPM)
C. 3.0 liter per minute (LPM)
D. 4.0 liter per minute (LPM)
E. none of the above

16. Marginal calibration occurs if the sensor's full span value or span reserve is between _____ of the applied (calibration) gas value\concentration.

A. 30 – 50%
B. 50 - 70%
C. 70 – 100%
D. 100 – 120%

17. According to the manufacturer's recommendation, how often should a functional “bump” test be performed on a gas instrument?

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

18. When the gas instrument is in non-latching mode, alarms set according to the Technician Team Competition in the MNM National Mine Contest Rule Book and exposed to 20.4% Oxygen, 1.2% Methane, 40.0 ppm Carbon Monoxide and 2.0 ppm Nitrogen Dioxide, it will _____.

A. be in high alarm condition
B. display "40" for the Carbon Monoxide reading
C. display "2.0" for the Nitrogen Dioxide reading
D. all of the above
E. only B and C

19. In non-latching mode for the gas instrument, all high alarm conditions (and not in Over Range condition) will clear or turn off automatically when the gas concentration has decreased to a level below the high alarm setpoint.

A. True
B. False

20. The primary reason for power being removed from the combustible (methane) sensor is to prevent an explosion in the atmosphere being monitored.

A. True
B. False

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% of 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. 0.7493
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

26. Line brattice can be _____

A. used to channel air intake air from the last open crosscut to the working section and across the face.
B. hung from a rough lumber frame, from timber posts, or from special fasteners.
C. use to flush out or ventilate a small area of the mine.
D. all of the above
E. none of the above

27. Mine doors installed to form an air-lock should always be opened and closed one at a time in order to maintain the air-lock.

A. True
B. False

28. Ventilation controls are used underground to properly distribute the air to all sections of the mine by controlling the _____ that travels.

A. direction of the airflow
B. amount of air
C. quality of air
D. all of the above
E. A and B

29. How many of the following statements are true?

- Methane is flammable with an explosive range of 5 to 15 percent when there is at least 12.1 percent oxygen.
- Methane is most explosive at 11 percent concentration.
- The specific gravity of methane is 0.0545

A. 0
B. 1
C. 2
D. 3

30. Firedamp is a mixture of carbon monoxide, carbon dioxide, methane, oxygen, nitrogen and hydrogen. It is called "firedamp" because it's usually found after a mine fire or explosion.

A. True
B. False