

# ***2014 National Metal and Nonmetal Mine Rescue Contest***

## **Team Trainer Competition Written Test**

### **Directions:**

- 1. Find the correct answer to each of the questions.**
- 2. Select only one answer per question.**
- 3. Then, fill in the corresponding circle on the answer sheet for each numbered question.**

**Good Luck!**



***August 4, 2014***

Please do not write on this test. Use the answer sheet provided.

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### Team Trainer Competition – Written Test

1. During the working of the field problem, ventilation changes will be considered as starting, stopping, altering, and/or redirecting the air current.
  - A. True
  - B. False
  
2. The team captain must orally warn the team each time loose ground conditions are encountered. However, such warning does not need to be given upon retreat through the same area.
  - A. True
  - B. False
  
3. For the purposes of contest work, no barricade will be breached without ventilating in front of the barricade if: Oxygen (O<sub>2</sub>) is below \_\_\_\_\_; or Carbon Monoxide (CO) exceeds \_\_\_\_\_.
  - A. 19.5 % O<sub>2</sub> or 1,200 ppm CO
  - B. 17.0 % O<sub>2</sub> or 1,500 ppm CO
  - C. 19.5 % O<sub>2</sub> or 1,500 ppm CO
  - D. 17.0 % O<sub>2</sub> or 1,200 ppm CO
  
4. Which of the following statements is true?
  - A. If survivor(s) can be safely evacuated with a few changes to existing conditions, they shall be evacuated before any further exploration is done.
  - B. If survivor(s) can be safely evacuated without changing conditions, they shall be evacuated only after exploration of the entire mine is done.
  - C. If survivor(s) can be safely evacuated without changing conditions, they shall be evacuated before any further exploration is done.
  - D. If survivor(s) cannot be safely evacuated, they shall be evacuated only after exploration of the entire mine is done.

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5. When a mine rescue team encounters a fire, indicated by “\_\_\_\_\_,” the team shall, without undue delay, seal the fire or regulate the fire, so as to restrict the air flow to the fire and prevent its further advance.
  - A. Face drill on fire
  - B. Explosives truck on fire
  - C. Front-end loader on fire
  - D. None of the above
  
6. During the technician team competition, all breathing apparatuses at the “simulated mine rescue station” must be examined in order to determine when they received their last monthly checks. Those units which have documentation (e.g., on a tag, on a piece of paper, or in a log book) showing the monthly checks were conducted within the past 30 days must be completely rechecked to ensure proper working order.
  - A. True
  - B. False
  
7. Inaccessible areas only need to be explored when there are miners unaccounted for or if an irrespirable air/gas mixture will be moved through the unexplored areas.
  - A. True
  - B. False
  
8. The volume of a gas changes in response to any change in atmospheric pressure or temperature. Which of the following answers is true?
  - A. An increase in pressure causes a gas to expand.
  - B. A decrease in pressure causes a gas to contract.
  - C. An increase in temperature causes a gas to expand.
  - D. All of the above
  
9. Pressure exerted on a gas is usually atmospheric pressure. Atmospheric pressure is measured on a \_\_\_\_\_.
  - A. Climatometer
  - B. Anemometer
  - C. Altimeter
  - D. Barometer

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10. High temperatures (or heat) cause gases to expand, so they diffuse more quickly.
  - A. True
  - B. False
  
11. Color, odor, and taste are physical properties that can help you identify all gases, especially during barefaced exploration.
  - A. True
  - B. False
  
12. Hydrogen is a highly explosive gas. Air containing 4 to 74.2 percent hydrogen will explode even when there is as little as 2 percent oxygen present.
  - A. True
  - B. False
  
13. Methane is flammable. Its explosive range is 5 to 15 percent when there is at least 12.1 percent oxygen. Methane is most explosive, however, in the \_\_\_ percent range.
  - A. 7.5 to 8
  - B. 9.5 to 10
  - C. 11.5 to 12
  - D. 13.5 to 14
  
14. Mine rescue teams should never alter ventilation without direct orders from the command center. The command center considers several factors before it orders a change in ventilation—most importantly, it has to consider how the alterations will affect ventilation into an unexplored area. The rule-of-thumb when altering ventilation is not to change the ventilation into an unexplored area. **WARNING: The wrong alterations could \_\_\_\_.**
  - A. Push deadly gases or smoke into areas where survivors are located.
  - B. Force explosive gases back over fire areas or hot spots and cause an explosion.
  - C. Cause changes in the air at the fresh air base.
  - D. All of the above

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15. There are two methods of measuring the velocity with a smoke tube. With one method, the reading is taken only at the center of the airway. The more accurate method of determining the air velocity is to take readings at quarter points within the airway.
  - A. True
  - B. False
  
16. Whether you put it underground or on the surface, the fresh air base should be located as far away as possible from the affected area of the mine and situated where it's assured a supply of good air.
  - A. True
  - B. False
  
17. If you encounter an obstacle fire with flaming equipment at its center, the fire should be fought by at least three people using hand-held extinguishers. These firefighters should approach the fire together from the intake air side, holding the extinguisher nozzle downward at a 45-degree angle.
  - A. True
  - B. False
  
18. During mine recovery, once ventilation has been reestablished and fresh air is advanced, apparatus crews can take over the rehabilitation and clean-up effort.
  - A. True
  - B. False
  
19. If you locate a survivor who is acting irrationally, it may be necessary to sedate him or her in order to protect the person from injury.
  - A. True
  - B. False
  
20. If a person is found in a \_\_\_\_\_ position, he/she is lying face down.
  - A. Supine
  - B. Lateral recumbent
  - C. Semi-Fowler's
  - D. None of the above
  
21. The lower chambers of the heart are called ventricles. They pump blood into the heart.
  - A. True
  - B. False

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22. A patient with no suspected spine injury should be placed on his/her left side to help maintain an open airway. This position is commonly called the recovery position or \_\_\_\_\_ position.
- A. Lateral recumbent
  - B. Prone
  - C. Semi-Fowler's
  - D. Trendelenburg
23. You should only attempt "finger sweeps" when the patient \_\_\_\_\_ and only when you can see the object that you are going after.
- A. Is choking
  - B. Is unresponsive
  - C. Is responsive
  - D. All of the above
24. Severe internal bleeding can bring about shock, heart and lung failure, and eventual death.
- A. True
  - B. False
25. A patient may need oxygen for many reasons, including: \_\_\_\_\_.
- A. Respiratory or cardiac compromise
  - B. Major blood loss
  - C. Shock
  - D. All of the above
26. A sign or symptom of a suspected spine injury may include numbness, weakness, or tingling in the extremities.
- A. True
  - B. False
27. Common signs and symptoms of an extremity injury include: \_\_\_\_\_.
- A. Deformity
  - B. Pain
  - C. Both A and B
  - D. Nether A nor B

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28. Per Federal regulation, each underground mine shall have a mine rescue notification plan outlining the procedures to follow in notifying the mine rescue teams when there is an emergency that requires their services.
- A. True
  - B. False
29. Per Federal regulation, upon completion of the initial training, all team members shall receive at least 40 hours of refresher training annually. This training shall be given at least 4 hours each month, or for a period of 8 hours every two months. This training shall include:
- A. Sessions underground at least once each three months.
  - B. Mine map training and ventilation procedures.
  - C. The wearing and use of the breathing apparatus by team members for a period of at least two hours while under oxygen every two months.
  - D. Only B and C
30. Per Federal regulation, mine rescue apparatus and equipment shall be maintained in a manner that will ensure readiness for immediate use. Further, \_\_\_\_\_.
- A. A person trained in the use and care of breathing apparatus shall inspect and test the apparatus at intervals not exceeding 30 days and shall certify by signature and date that the inspections and tests were done.
  - B. When the inspection indicates that a corrective action is necessary, the corrective action shall be made, and the person shall record the corrective action taken.
  - C. The certification and the record of corrective action shall be maintained at the mine rescue station for a period of one year and made available on request to an authorized representative of the Secretary.
  - D. All of the above