

# ***2016 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!**



***July 25, 2016***

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

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1. In order to plan a recovery operation, there must be an initial assessment of underground conditions. One of the main things your team will be checking is the extent of damage to the ventilation system.
  - A. True
  - B. False
  
2. When opening a sealed fire area, observers should be stationed at the main fans to ensure proper operation. If the fans slow down or malfunction, teams working underground should be withdrawn immediately.
  - A. True
  - B. False
  
3. For the purposes of contest work, no barricade will be breached without ventilating in front of the barricade if: Hydrogen Sulfide (H<sub>2</sub>S) exceeds \_\_\_\_\_; or Carbon Dioxide (CO<sub>2</sub>) exceeds \_\_\_\_\_.
  - A. 100 ppm H<sub>2</sub>S or 1.0% CO<sub>2</sub>
  - B. 20 ppm H<sub>2</sub>S or 4.0% CO<sub>2</sub>
  - C. 100 ppm H<sub>2</sub>S or 4.0% ppm CO<sub>2</sub>
  - D. 20 ppm H<sub>2</sub>S or 1.0% CO<sub>2</sub>
  
4. At the conclusion of the Technician Team Competition, \_\_\_\_\_.
  - A. The apparatus and multi-gas instrument(s) must be left in a “ready-for-use” condition.
  - B. The apparatus must be assembled with hoses connected to the facepiece and attached to the apparatus.
  - C. The multi-gas instrument(s) must be fully assembled, operating, properly configured, and left “on” with the peaks cleared.
  - D. All of the above.
  
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. Intense heat
  - B. Explosives truck on fire
  - C. Fire out of control
  - D. Both A and C

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6. According to the First Aid Competition – Guidelines and Procedures, if a tourniquet is required in the first aid problem, application can be fully simulated. Bleeding will be considered controlled and acknowledged by the judge.
  - A. True
  - B. False
  
7. According to the First Aid Competition – General Rules, any team found committing an act that will endanger a patient will receive \_\_\_\_\_ for each infraction.
  - A. Fifteen (15) discounts
  - B. Twenty-five (25) discounts
  - C. Fifty (50) discounts
  - D. None of the above
  
8. At each gas box, there will be fifteen (15) discount points deducted per gas if the team does not report the respective gas concentration within the acceptable limits. For CO (carbon monoxide), readings will be considered to be correct if within plus or minus \_\_\_\_\_ of the actual value present.
  - A. 5 %
  - B. 10 %
  - C. 15 %
  - D. 20 %
  
9. During rescue operations at the mine, an area completely separate from the family waiting area should be setup as a press room, where media representatives can gather to receive news releases issued from the \_\_\_\_\_.
  - A. Incident commander
  - B. Mine superintendent
  - C. Information center
  - D. Corporate headquarters
  
10. During rescue operations at the mine, located at the top of the chain-of-command is the mine superintendent or a designated responsible person who delegates duties to other people. Federal and State officials will inevitably arrive. Federal officials can never take charge of the operation. Their role is simply to consult with and advise the company on how the rescue work might best be carried out safely.
  - A. True
  - B. False
  
11. Normal air contains approximately 78 percent nitrogen (N<sub>2</sub>). Nitrogen is nontoxic. Therefore, it can never be an asphyxiant.
  - A. True
  - B. False

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12. One of the four main causes of oxygen deficiency in a mine is consumption of oxygen by workers.
- A. True
  - B. False
13. Which of the following is true for oxides of nitrogen?
- A. When mixed with moisture in your lungs, they form acids that corrode your respiratory passages and cause them to swell.
  - B. They will neither burn nor explode.
  - C. They are highly soluble in water.
  - D. Only A and B
14. Carbon Monoxide (CO) is highly toxic even in low concentrations. It is also explosive and flammable. Its explosive range in normal air is 12.5 to 74.2 percent. However, it is most explosive \_\_\_\_\_.
- A. At 14.2 percent.
  - B. Between 7 and 8 percent.
  - C. In the 9.5 to 10 percent range.
  - D. None of the above
15. As the team advances through the mine during exploration, all ventilation controls and air lines should be checked in the affected area of the mine. The command center should be told the type of damage and the extent of damage found. The condition of air lines is important because \_\_\_\_\_.
- A. They can be used to operate some equipment.
  - B. They may be operating auxiliary fans.
  - C. Trapped miners may be using them as an air supply.
  - D. All of the above
16. Mine rescue and recovery work often involves building or rebuilding ventilation controls. However, teams must make no alterations or do any construction without the approval of the fresh air base coordinator.
- A. True
  - B. False
17. In accordance with 30 CFR 46(a)(8), each mine rescue station shall be provided with at least the following equipment: one portable mine rescue communication system (approved under Part 23) or a sound-powered communication system. The wires or cables of the system shall be of sufficient tensile strength to be used as a manual communication system and shall be at least 1,000 feet in length.
- A. True
  - B. False

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18. In accordance with 30 CFR 46(b)(3), mine rescue apparatus and equipment shall be maintained in a manner that will ensure readiness for immediate use. The certification and the record of corrective action shall be maintained at the mine rescue station for a period of \_\_\_ and made available on request to an authorized representative of the Secretary.
- A. 90 days
  - B. 6 months
  - C. One year
  - D. Five years
19. Most small dry chemical fire extinguishers are effective \_\_\_ to \_\_\_ feet from the fire. Standing too far away from the fire will not put the fire out and may waste valuable time and the contents of the extinguisher.
- A. 5 to 20
  - B. 6 to 8
  - C. 10 to 15
  - D. All of the above
20. When a team goes into a mine to explore or fight a fire, it should be concerned with two main things \_\_\_\_.
- A. Low oxygen and toxic gases.
  - B. The location of explosives and fuel storage underground.
  - C. The possibility of an explosion and the fire spreading.
  - D. None of the above
21. \_\_\_\_ are more effective when you can be positioned relatively close to the fire.
- A. Small hand-held, dry chemical fire extinguishers
  - B. Water hoses equipped with fog spray nozzles
  - C. Water hoses equipped with special foam nozzles and low expansion foam
  - D. All of the above
22. A patient with no suspected spine injury who is experiencing difficulty breathing can be placed in a semi-Fowler's position.
- A. True
  - B. False
23. There are numerous sizes of oropharyngeal airways (OPAs), designed to fit infants, children, and adults. When determining the size of to OPA to use, you can use the patient's little finger as a guide to approximate the diameter of the patient's nostril opening and estimate the length needed by measuring from the tip of the patient's nose to the earlobe.
- A. True
  - B. False

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24. To move a prone patient to a supine position and ensure stability of the head and spine where a trauma injury is suspected, perform a “log roll.” This move can be done with as few as two rescuers, but three is ideal to minimize \_\_\_\_\_ during the procedure.
- A. Twisting of the patient’s spine
  - B. Movement of the patient’s torso
  - C. Strain on the patient’s neck
  - D. None of the above
25. The integumentary system involves the \_\_\_\_\_ which is the largest organ of the human body.
- A. Liver
  - B. Brain
  - C. Small intestines
  - D. Skin
26. A trauma patient is one who has received a physical injury of some type. The type of physical exam you perform and the order in which you do the various steps will be based on the \_\_\_\_\_.
- A. Patient’s vital signs.
  - B. Patient’s medical history.
  - C. Mechanism of injury.
  - D. Only A and B
27. Overexposure to hot and humid environments can cause the body to generate too much heat, which can create an abnormally high body core temperature known as \_\_\_\_\_. Left unchecked, it can lead to a serious emergency and even death.
- A. Hypothermia
  - B. Heat exhaustion
  - C. Hyperthermia
  - D. Heat stroke
28. When applying a rigid splint to an extremity, fill the space between the patient and the splint with soft cushions or bandages. Do this \_\_\_\_\_.
- A. Only when the injury is angulated.
  - B. Only when the injury is not angulated.
  - C. Whether or not the injury is angulated.
  - D. None of the above

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29. During the mine rescue field and first aid competitions, if a team member fails to take BSI precautions before physically contacting a patient, the team will receive 15 discounts (for each infraction, each occurrence).
- A. True
  - B. False
30. Which of the following can occur in a patient who experienced extreme blood loss due to injury?
- A. Cardiogenic shock
  - B. Hemorrhagic shock
  - C. Hypovolemic shock
  - D. Both B and C

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### ANSWER KEY

- |              |                      |   |
|--------------|----------------------|---|
| 1. <b>A</b>  | pg. 7-4              | MSHA Publication 3027                                 |
| 2. <b>A</b>  | pg. 7-6              | MSHA Publication 3027                                 |
| 3. <b>C</b>  | pg. 28               | 2016 National MNM Mine Rescue Contest Rules           |
| 4. <b>D</b>  | pgs. 70 and 73       | 2016 National MNM Mine Rescue Contest Rules           |
| 5. <b>D</b>  | pg. 33               | 2016 National MNM Mine Rescue Contest Rules           |
| 6. <b>B</b>  | pg. 98               | 2016 National MNM Mine Rescue Contest Rules           |
| 7. <b>C</b>  | pg. 96               | 2016 National MNM Mine Rescue Contest Rules           |
| 8. <b>B</b>  | pg. 39               | 2016 National MNM Mine Rescue Contest Rules           |
| 9. <b>C</b>  | pg. 1-5              | MSHA Publication 3027                                 |
| 10. <b>B</b> | pg. 1-6              | MSHA Publication 3027                                 |
| 11. <b>B</b> | pg. 2-14             | MSHA Publication 3027                                 |
| 12. <b>A</b> | pg. 2-14             | MSHA Publication 3027                                 |
| 13. <b>D</b> | pg. 2-17             | MSHA Publication 3027                                 |
| 14. <b>D</b> | pg. 2-16             | MSHA Publication 3027                                 |
| 15. <b>D</b> | pg. 3-15             | MSHA Publication 3027                                 |
| 16. <b>B</b> | pg. 3-21             | MSHA Publication 3027                                 |
| 17. <b>A</b> | pg. 4-13             | MSHA Publication 3027 - 30 CFR 49.6(a)(8)             |
| 18. <b>C</b> | pg. 4-14             | MSHA Publication 3027 - 30 CFR 49.6(b)(3)             |
| 19. <b>B</b> | pg. 5-7              | MSHA Publication 3027                                 |
| 20. <b>C</b> | pg. 5-12             | MSHA Publication 3027                                 |
| 21. <b>D</b> | pgs. 5-7, 5-8, & 5-9 | MSHA Publication 3027                                 |
| 22. <b>A</b> | pg. 108              | Ninth Edition of Brady "First Responder" (Chapter 5)  |
| 23. <b>B</b> | pgs. 156 and 158     | Ninth Edition of Brady "First Responder" (Chapter 8)  |
| 24. <b>A</b> | pg. 108              | Ninth Edition of Brady "First Responder" (Chapter 5)  |
| 25. <b>D</b> | pg. 81               | Ninth Edition of Brady "First Responder" (Chapter 4)  |
| 26. <b>C</b> | pg. 258              | Ninth Edition of Brady "First Responder" (Chapter 12) |
| 27. <b>C</b> | pg. 336              | Ninth Edition of Brady "First Responder" (Chapter 16) |
| 28. <b>C</b> | pg. 423              | Ninth Edition of Brady "First Responder" (Chapter 19) |
| 29. <b>A</b> | pgs. 44/47 & 104     | 2016 National MNM Mine Rescue Contest Rules           |
| 30. <b>D</b> | pgs. 397 & 398       | Ninth Edition of Brady "First Responder" (Chapter 18) |