

# 2017 Northern Mine Rescue Contest

## Written Exam

### Team Trainer



**June 5, 2017**

**Clymer, New York**

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

**2017 Northern Mine Rescue Contest  
Written Exam – Team Trainer**

**Directions: Fill in the corresponding bubble on your Scantron sheet to indicate the letter preceding the correct answer to each of the following questions. Select only one answer per question.**

1. In accordance with 30 CFR §49.6(a)(6), each mine rescue station shall be provided with at least the following equipment: Four gas detectors appropriate for each type of gas that may be encountered at the mines served. The gas detectors must measure concentrations of methane from 0.0 percent to 100 percent of volume.
  - A. True
  - B. False
  
2. In accordance with 30 CFR §49.6(a)(6), each mine rescue station shall be provided with at least the following equipment: Four gas detectors appropriate for each type of gas that may be encountered at the mines served. The gas detectors must measure concentrations of oxygen from \_\_\_\_\_.
  - A. 0.0 to at least 20.9 percent of volume
  - B. 0.0 to at least 19.5 percent of volume
  - C. 0.0 to at least 20 percent of volume
  - D. None of the above
  
3. In accordance with 30 CFR §49.6(b)(1), “Mine rescue apparatus and equipment shall be maintained in a manner that will ensure readiness for immediate use. A person trained in the use and care of breathing apparatus shall inspect and test the apparatus at intervals not exceeding \_\_\_\_ and shall certify by signature and date that the inspections and tests were done.”
  - A. 14 days
  - B. 30 days
  - C. 2 weeks
  - D. None of the above
  
4. In accordance with 30 CFR §49.6(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. three months
  - B. six months
  - C. one year
  - D. five years
  
5. In accordance with 30 CFR §49.6(a)(8), each mine rescue station shall be provided with at least the following equipment: One portable mine rescue communication system (approved under \_\_\_\_ of this title) or a sound-powered communication system.
  - A. Part 57
  - B. Part 23
  - C. Part 18
  - D. None of the above

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

6. Hydrogen is a highly explosive gas. Air containing \_\_\_\_ percent hydrogen will explode even when there is as little as 5 percent oxygen present.
- A. 4 to 27.4
  - B. 4 to 42.7
  - C. 4 to 74.2
  - D. None of the above
7. Carbon monoxide is explosive and flammable. Its explosive range in normal air is \_\_\_\_ percent.
- A. 12.5 to 27.4
  - B. 12.5 to 42.7
  - C. 12.5 to 74.2
  - D. None of the above
8. Hydrogen sulfide is flammable and explosive in concentrations from \_\_\_\_\_ in normal air.
- A. 4.3 to 45.5
  - B. 4.3 to 54.5
  - C. 4.3 to 55.4
  - D. None of the above
9. 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. 6.5 to 10
  - B. 7.5 to 10
  - C. 8.5 to 10
  - D. 9.5 to 10
10. Acetylene is combustible but it will not support combustion. Its explosive range in normal air is \_\_\_\_ percent.
- A. 2.5 to 60
  - B. 2.5 to 70
  - C. 2.5 to 80
  - D. None of the above
11. Carbon dioxide (CO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), nitrogen (N<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), and radon (Rn) \_\_\_\_\_.
- A. will neither burn nor explode
  - B. have a specific gravity greater than 1.0
  - C. are nontoxic
  - D. All of the above

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

12. During exploration of the mine, under no circumstances do you ever alter ventilation without orders to do so from the command center.
- A. True
  - B. False
13. The fresh air base coordinator maintains crucial communication links with the command center and the working rescue team. In addition, the coordinator is responsible for just about everything that goes on in the mine.
- A. True
  - B. False
14. Because rescue work is strenuous and demanding, it's important for team members to be well rested. If, it's also recommended that you \_\_\_\_\_.
- A. don't eat within one hour of the time you'll be wearing your apparatus
  - B. don't drink alcoholic beverages for at least 12 to 18 hours before you get under oxygen.
  - C. limit intake of stimulants such as coffee, colas, etc., because these substances increase heart and respiration rates.
  - D. All of the above
15. Think of Class B fires as those that involve contents that will \_\_\_\_\_.
- A. **B**ake
  - B. **B**laze
  - C. **B**oil
  - D. **B**urst
16. If the bodies are not recovered soon after death, they will begin to decompose. One of the factors that influence body deterioration is \_\_\_\_\_.
- A. air temperature
  - B. extent of injuries
  - C. body size
  - D. Both A and C
17. Sometimes, it may be necessary to fight a fire from a distance, or "indirectly," by sealing the fire or by filling the fire area with foam, sandfill, or water. The indirect methods work \_\_\_\_\_.
- A. by separating the fuel from the fire
  - B. by excluding oxygen from the fire
  - C. by stopping the chemical reactions within the fire
  - D. None of the above

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

18. During the field competition, if a team member travels under bad roof or ground, then the team is assessed 15 discounts for endangerment.
- A. True
  - B. False
19. During the field competition, which of the following is not an example of team endangerment?
- A. Changing conditions of the mine ventilation system in such a manner that an explosive mix is moved over an ignition source
  - B. Changing conditions of the mine ventilation system in such a manner that an explosive mix is moved over an unexplored area
  - C. Changing conditions of the mine ventilation system in such a manner that an IDLH atmosphere is directed over survivor(s)
  - D. Failure to check a shaft for possible damage, or the presence of fire or flooding, prior to traveling through it.
20. During the first aid competition at Station 2, as the team conducts a primary assessment of a patient, if they fail to assess the patient's breathing (look, listen, feel) then \_\_\_ discounts are assessed.
- A. 5
  - B. 10
  - C. 15
  - D. 25
21. For the purposes of contest work, no barricade will be breached without ventilating in front of the barricade if:
- A. Carbon Monoxide (CO) is 1,100 ppm (0.11%)
  - B. Nitrogen Dioxide (NO<sub>2</sub>) is 30 ppm (0.003%)
  - C. Oxygen (O<sub>2</sub>) is 17.5%
  - D. None of the above
22. During the field competition, a team that fails to complete the problem within the established time limit will be assessed a total of \_\_\_\_ discounts by Judge #2.
- A. 100
  - B. 50
  - C. 25
  - D. None of the above
23. During the technician team competition, as the team conducts the apparatus checks/problem diagnosis, if a deficiency (bug) is not found then \_\_\_ discounts are assessed.
- A. 5
  - B. 10
  - C. 15
  - D. None of the above

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

24. The three steps to controlling external bleeding of an extremity include: direct pressure, the use of a pressure bandage and applying a tourniquet (if first two steps had failed).
- A. True
  - B. False
25. Under the right conditions, pathogens can enter the body, multiply, and produce harmful effects. Pathogens can enter the body via \_\_\_\_\_.
- A. adsorption
  - B. infection
  - C. ingestion
  - D. intubation
26. Body substance isolation (BSI) precautions include wearing protective gloves, masks, gowns, and eyewear.
- A. True
  - B. False
27. If adequate breathing is not quickly restored in a patient, the patient may stop breathing altogether. This very dangerous condition is known as \_\_\_\_\_.
- A. respiratory compromise
  - B. respiratory arrest
  - C. respiratory distress
  - D. respiratory alkalosis
28. \_\_\_\_\_ is a move performed by two rescuers, one lifting the patient's arms and one lifting the patient's legs.
- A. Direct ground lift
  - B. Direct carry
  - C. Draw sheet method
  - D. Extremity lift
29. Blood pressure is determined by measuring the pressure changes in the \_\_\_\_\_.
- A. arteries
  - B. veins
  - C. capillaries
  - D. All of the above
30. Bites and stings are common ways that poisons can be \_\_\_\_\_ into our bodies.
- A. ingested
  - B. injected
  - C. inhaled
  - D. absorbed

## **ANSWER KEY**

### **2017 Northern Mine Rescue Contest Written Exam – Team Trainer**

#### **All questions taken from MSHA Publication 3027**

<u>Question</u>	<u>Answer</u>	<u>Source</u>
1.	A.	MSHA Publication 3027 - Module 4, pg. 4-13 / 30 CFR §49.6(a)(6)
2.	C.	MSHA Publication 3027 - Module 4, pg. 4-13 / 30 CFR §49.6(a)(6)
3.	B.	MSHA Publication 3027 - Module 4, pg. 4-14 / 30 CFR §49.6(b)(1)
4.	C.	MSHA Publication 3027 - Module 4, pg. 4-14 / 30 CFR §49.6(b)(3)
5.	B.	MSHA Publication 3027 - Module 4, pg. 4-13 / 30 CFR §49.6(a)(8)
6.	C.	MSHA Publication 3027 - Module 2, pg. 2-18
7.	C.	MSHA Publication 3027 - Module 2, pg. 2-16
8.	A.	MSHA Publication 3027 - Module 2, pg. 2-19
9.	D.	MSHA Publication 3027 - Module 2, pg. 2-22
10.	C.	MSHA Publication 3027 - Module 2, pg. 2-24
11.	A.	MSHA Publication 3027 - Module 2 (see description of each gas)
12.	A.	MSHA Publication 3027 - Module 3, pg. 3-3
13.	B.	MSHA Publication 3027 - Module 4, pg. 4-9
14.	D.	MSHA Publication 3027 - Module 4, pg. 4-12
15.	C.	MSHA Publication 3027 - Module 5, pg. 5-5
16.	D.	MSHA Publication 3027 - Module 6, pg. 6-9
17.	B.	MSHA Publication 3027 - Module 5, pg. 5-17
18.	A.	2017-2018 MRC Rules, pg. 49 (Judge 1 - UG Rule 10a Interpret.)
19.	C.	2017-2018 MRC Rules, pages 49 - 51 (Judge 1 - UG Rule 10b Interpret.)
20.	B.	2017-2018 MRC Rules, pg. 104 (Judges' Discount Card – Station 2)
21.	B.	2017-2018 MRC Rules, Barricades, pages 29 - 30
22.	C.	2017-2018 MRC Rules, pg. 52 (Judge 2 - Surf Rule 6)
23.	A.	2017-2018 MRC Rules, pages 76, 84, or 85 (Judges' Scorecard)
24.	A.	Brady's EMR - 10th Edition, Chapter 18, pg. 359
25.	C.	Brady's EMR - 10th Edition, Chapter 3, pg. 37
26.	A.	Brady's EMR - 10 <sup>th</sup> Edition, Chapter 3, pg. 36
27.	B.	Brady's EMR – 10 <sup>th</sup> Edition, Chapter 9, pg. 143
28.	D.	Brady's EMR - 10 <sup>th</sup> Edition, Chapter 6, pages 104 - 106
29.	A.	Brady's EMR - 10 <sup>th</sup> Edition, Chapter 12, pg. 227
30.	B.	Brady's EMR - 10 <sup>th</sup> Edition, Chapter 16, pg. 320