



2010 Central Mine Rescue Contest

May 14-15, 2010

Kellogg, Idaho

Written Exam for the Mine Rescue Field Event

All tests must be completed within a total of 60 minutes

Mine/Organization _____

Name & Position # _____

1. Decreased atmospheric pressure has an effect on the diffusion rate of a gas by slowing it down.
 - a. true
 - b. false
2. The TLV for carbon monoxide is 50 ppm or:
 - a. 0.5%
 - b. 0.05%
 - c. 0.005%
 - d. none of the above
3. Smoke is a result of combustion. It consists of tiny particles of _____ and _____ matter suspended in air.
 - a. semi-solid and low density
 - b. toxic and combustible
 - c. solid and liquid
 - d. all of the above
4. Afterdamp is toxic, explosive, and can be oxygen deficient. It contains the following mixture of gases:
 - a. methane, propane, pentane, sub-micron particulates, and air
 - b. carbon dioxide, sulfur dioxide, nitrogen, argon, and air
 - c. carbon monoxide, carbon dioxide, methane, oxygen, nitrogen, and hydrogen
 - d. carbon monoxide, oxygen, water vapor, oxides of nitrogen, and air

5. Very tiny amounts of sulfur dioxide (_____% or less) will irritate your eyes and respiratory tract.
- a. 0.0001
 - b. 0.001
 - c. 0.01
 - d. none of the above
6. The purpose of a(n) _____ is to separate two different atmospheres while still permitting miners to enter and exit without mixing the atmospheres.
- a. regulator
 - b. overcast
 - c. airlock
 - d. bulkhead
7. The pitot tube used for measuring air flow in ducts or tubing has a U-tube water gauge or some other differential pressure gauge for determining the velocity pressure inside the duct or tubing.
- a. true
 - b. false
8. High expansion foam removes two legs of the fire triangle. They are:
- a. fuel and oxygen
 - b. oxygen and heat
 - c. heat and fuel
 - d. none of the above
9. Chest injuries take priority over a fractured arm under the triage system.
- a. true
 - b. false
10. Moderate shock takes priority over a fractured arm under the triage system.
- a. true
 - b. false
11. A regular anemometer actually measures _____ of the air.
- a. velocity
 - b. gas concentrations
 - c. linear feet of travel
 - d. area

12. Of the following gases, which one is not soluble in water?
- a. methane
 - b. sulfur dioxide
 - c. hydrogen
 - d. none of the above
13. It is recommended that you do not drink alcoholic beverages for at least _____ hours before you go under oxygen.
- a. 6 to 12
 - b. 10 to 15
 - c. 12 to 18
 - d. none of the above
14. A high velocity anemometer is used for measuring velocities from _____ feet per minute.
- a. 2,000 to 12,000
 - b. 1,000 to 10,000
 - c. 2,000 to 10,000
 - d. 1,000 to 12,000
15. Oxygen is:
- a. lighter than air.
 - b. heavier than air.
 - c. less dense than air.
 - d. equal in density to air.
16. Using a smoke tube, you determine the air velocity is 100 feet per minute through a drift that is 10 feet high by 10 feet wide. What is the quantity of airflow through this drift in cubic feet per minute?
- a. 1,000 ft³/min
 - b. 10,000 ft³/min
 - c. 20,000 ft³/min
 - d. 200,000 ft³/min
 - e. None of the above
17. Increased temperature can cause mine gases to do what?
- a. expand and diffuse more quickly
 - b. contract and diffuse less quickly
 - c. contract and diffuse more quickly
 - d. expand and diffuse less quickly

18. In the "Fire Triangle," a combustion chain reaction is not possible if one of the legs of the "Fire Triangle" is missing.
- a. true
 - b. false
19. Oxides of nitrogen can be produced by sparking or electrical arcing.
- a. true
 - b. false
20. Natural ventilation occurs due to:
- a. external wind
 - b. differences in air pressure caused by temperature differences between surface and underground
 - c. mining equipment moving through mine workings
 - d. both b & c
21. A smoke tube test is used when the air velocity is less than:
- a. 600 feet per minute
 - b. 120 feet per minute
 - c. 900 feet per minute
 - d. 180 feet per minute
22. Class B fires are fires that involve:
- a. metals like magnesium
 - b. electrical fires
 - c. flammable or combustible liquids
 - d. ordinary combustibles like paper or wood
23. A _____ extinguisher would be appropriate for extinguishing a fire involving plastic or rubber.
- a. Class A
 - b. Class B
 - c. Class C
 - d. both a and b
24. MSHA requires mine rescue stations serving underground M/NM mines to have how many gas detectors for each gas which may be encountered at the mine they serve?
- a. two
 - b. three
 - c. four
 - d. five

25. A mine rescue communication line must have the tensile strength sufficient for it to be used as a manual communication system.

- a. true
- b. false

26. Your team is not going to be rescuing survivors, but will be erecting ventilation controls. Do they need a spare apparatus with them underground?

- a. yes
- b. no

27. Teams must have gas detection capability to measure the content of oxygen from 0.0 percent to at least 20.0 percent?

- a. true
- b. false

28. The _____ is used to link team members together.

- a. com line
- b. safety line
- c. linkline
- d. both a and c

29. A smoke tube is used to measure what?

- a. air velocity
- b. air direction
- c. air quantity
- d. all of the above
- e. both a and b

30. Ethane, propane, and butane are _____.

- a. heavy hydrocarbons
- b. toxic and explosive gases
- c. colorless and tasteless
- d. usually found near the mine roof
- e. all of the above
- f. both a and c

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Answer Key for Written Exam for the Mine Rescue Field Event

All questions and answers taken from the 2008 edition of MSHA Publication 3027 (formerly IG 6)

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