

Name	
Team	
Score	30

Written Examination- Mine Rescue

Choose the most correct answer from those provided. There are 30 questions, and each is equally weighted on your team score.

1. The first symptom of carbon monoxide poisoning is:
 - a. Bloodshot eyes
 - b. Tightening across the forehead
 - c. Shortness of breath
 - d. Unconsciousness
 - e. None of the above
2. Smoke tubes are useful to do which of the following?
 - a. Finding velocity of slow moving (<120 ft/min) air
 - b. Show direction of air movement
 - c. Fit testing BG-4 breathing apparatuses
 - d. A and B
 - e. All of the above
3. Before going underground, what order should the following steps be completed in?
 - i. Don apparatus
 - ii. Proceed to fresh air base
 - iii. Check team equipment for readiness to begin
 - iv. Check team members for readiness to begin
 - a. ii, i, iii, iv
 - b. iv, ii, iii, i
 - c. i, iv, iii, ii
 - d. iii, iv, ii, i
 - e. None of these options are in the correct order
4. Which of the following conditions are sufficient reasons to fight a fire indirectly?
 - a. Extremely high temperatures
 - b. Bad ground preventing access to fire
 - c. Explosive atmosphere
 - d. Attempts to fight fire directly have proven ineffective
 - e. All of the above
5. There are ____ team members who wear a breathing apparatus and conduct exploration.
 - a. 1

- b. 4
 - c. 5
 - d. 6
 - e. 7
6. Clean, dry air at sea level contains ____ Nitrogen (N₂) (by volume)
- a. 60%
 - b. 73.015%
 - c. 78.084%
 - d. 80%
 - e. None of the above
7. Hydrogen (H₂) present in air can be explosive over what range?
- a. 4.3-45.5%
 - b. 4-74.2%
 - c. 12.5-74.2%
 - d. 5-15%
 - e. 2.5-80%
8. Hydrogen sulfide (H₂S) present in air can be explosive over what range?
- a. 4.3-45.5%
 - b. 4-74.2%
 - c. 12.5-74.2%
 - d. 5-15%
 - e. 2.5-80%
9. Methane (CH₄) present in air can be explosive over what range?
- a. 4.3-45.5%
 - b. 4-74.2%
 - c. 12.5-74.2%
 - d. 5-15%
 - e. 2.5-80%
10. Which legal requirement specifies the equipment required for a mine rescue team?
- a. 30 CFR 49.6
 - b. CRS 42-4-1106
 - c. 36 USC §10
 - d. 30 CFR 23
 - e. None of the above
11. Which statement is not correct about postmortem processes?
- a. The more muscle in the corpse, the sooner rigor mortis will set in.
 - b. Fluid will accumulate near the surface of the skin.
 - c. Body parts exposed to air will decompose faster.
 - d. Blood accumulates in lower spots in the body at time of death (dependent lividity).
 - e. All of these statements are correct
12. Progressive ventilation is:
- a. The slow restarting of the main vent fan

- b. Reventilating the sealed area with a series of successive blocks
 - c. Restarting ventilation to an entire sealed area at once
 - d. Advancing vent tube down a drift, blowing out noxious or hazardous gases
 - e. None of the above
13. A temporary bulkhead is:
- a. A temporary redirection of air in lieu of a permanent bulkhead
 - b. A curtain to redirect air into an area that wouldn't receive adequate ventilation
 - c. Used to prevent short-circuiting of ventilation at an intersection
 - d. Hung from the back to pull air into a drift with a fan at one end
 - e. None of the above.
14. When a team encounters water, the first step would be to stir the water and measure gases above
- a. True
 - b. False
15. This chemical compound has a specific gravity of 0.9107, is explosive from 2.5-80%, has a characteristic garlic odor, and is typically formed when CH_4 is heated or 'burned' in an anoxic environment.
- a. $(\text{Fe,Mg})_2\text{SiO}_4$
 - b. $\text{C}_3\text{H}_5\text{N}_3\text{O}_9$
 - c. C_2H_2
 - d. C_8H_{18}
 - e. $\text{C}_7\text{H}_5\text{N}_3\text{O}_6$
16. Which person is typically responsible for providing teams with the most updated mine map and alerting adjoining mines?
- a. Chief electrician
 - b. Chief mechanic
 - c. Outside supervisor
 - d. Chief engineer
 - e. None of the above
17. Fires that contain a combustible liquid are considered:
- a. Class A
 - b. Class B
 - c. Class C
 - d. Class D
 - e. None of the above
18. It is permissible to allow a survivor to walk out on their own if they have no injuries and seem to be ok (allowing your team to continue exploring further).
- a. True
 - b. False
19. Which of the following is not true about radon gas (${}_{86}\text{Rn}_{(g)}$)?
- a. Radon is insoluble in water ($\text{H}_2\text{O}_{(l)}$).

- b. Radon releases alpha particles as it radioactively decays, which can cause lung cancer when inhaled.
 - c. Radon is nonexplosive and nonflammable
 - d. Radon is found primarily in uranium mines, but often found in other hard rock mines.
 - e. All of these statements are true.
20. Can smoke explode?
- a. Yes, if there is a sufficient quantity of CO present
 - b. Yes, if there is a sufficient quantity of airborne hydrocarbons present
 - c. Yes, for multiple reasons
 - d. Yes, but for another reason
 - e. No, smoke can't explode under any circumstances
21. The main responsibilities of the fresh-air base coordinator include:
- a. Maintaining a communications link between the team and the mine superintendent
 - b. Following the team's progress on the mine map with simultaneous mapping
 - c. Providing medical treatment to injured miners that are brought to the fresh-air base
 - d. Deciding on the status of ventilation controls and alteration of ventilation
 - e. None of the above
22. Can the mine fan be reversed or stopped while a team is underground?
- a. Yes, but only at the team's request
 - b. Yes, but only if the team is within an airlock or other sealed area to be protected from the ventilation change
 - c. Yes, but only if there are confirmed no fires underground.
 - d. Yes, but under different conditions than have been specified
 - e. No, the fan should not be stopped or reversed while a team is underground.
23. Which of the following situations would 'crush syndrome' be suspect?
- a. Patient has heavy debris crushing an extremity or the abdomen/thorax
 - b. Patient has been subjected to immense blast overpressure
 - c. Patient was behind a collapsed area and is suffering a psychotic episode
 - d. Patient feels a romantic inclination
 - e. None of the above
24. The decision to unseal an area sealed based on fire is made based on what factors?
- a. Gas conditions beyond the seal
 - b. Extent and intensity of the fire before it was sealed
 - c. Characteristics of the burning material and surrounding strata
 - d. Effect of barometric pressure and temperature on the sealed area
 - e. All of the above
25. What would not be considered in the reventilation after an explosion?
- a. Concentrations of explosive gases
 - b. Concentration of oxygen
 - c. Any possible sources of ignition in the area
 - d. Presence of deceased miners in the area (7-10, ¶13)

e. All of the above would be considered



26. This symbol refers to a/an:

- a. Seal
- b. Fan
- c. Undercast
- d. Mobile equipment
- e. None of the above



27. This symbol represents a/an:

- a. Barricade
- b. Gas test
- c. Unsuccessful attempt to seal
- d. Temporary stopping, no longer intact
- e. None of the above

28. Blower fans are most commonly used

- a. In very deep mines
- b. In mines with little overburden
- c. In conjunction with an exhausting fan
- d. Where there is no electricity underground
- e. None of the above

29. Should the family waiting area be located near the media briefing area?

- a. Yes (without condition)
- b. Yes, but only if the families agree and/or request it
- c. Yes, but only if the media requests it
- d. Yes, but only if there are no other options
- e. No. These two areas should be completely separate.

30. Firedamp contains:

- a. Methane (CH_4) and air
- b. Methane and carbon monoxide (CO)
- c. Propane (C_3H_8), octane (C_8H_{18}), nonane (C_9H_{20}), and hydrogen sulfide (H_2S)
- d. Methane and water vapor ($\text{H}_2\text{O}_{(g)}$)
- e. None of the above