MINE RESCUE (Jeopardy Style)

Category No. 1 – FIRE FIGHTING

The particles in smoke are usually \_\_\_\_\_\_\_\_\_\_.

1. Soot
2. Carbon
3. Tar-like substances
4. Hydrocarbons
5. All of the above

The stream of dry chemical of a fire extinguisher must be directed:

1. 12 inches ahead of the flame edge
2. Directly at the flame
3. 6 inches behind the flame edge
4. None of the above

Dry chemical extinguishers stop the reaction between:

1. Fuel and ignition source
2. Oxygen and fuel
3. Oxygen and ignition source
4. Fuel and heat

Class “C” fires are best extinguished by:

1. Water
2. High expansion foam
3. Carbon dioxide and certain dry chemicals
4. Low expansion foam

Which of the following is not a main factor to consider when unsealing a fire:

1. Extent and intensity of the fire at the time of sealing
2. Tightness of the seals
3. Effect of barometric pressure on the enclosed area
4. Location of the fire with respect to egress
5. Gas conditions as indicated by analysis of air samples taken from behind the seals

When sealing an underground mine fire area, after temporary seals are erected, a waiting period of \_\_\_\_\_\_\_ is recommended before beginning construction on permanent seals.

1. 24 to 48 hours
2. 48 to 72 hours
3. about 72 hours
4. at least 7 days

Category No. 2 – MINE GASES

The specific gravity of Carbon Dioxide is:

1. 1.5894
2. 0.5691
3. 1.1054
4. 1.5291

Which is not true for Hydrogen Sulfide?

1. Specific gravity – 1.1906
2. Can be liberated from methane feeders
3. 0.07% to 0.10% can lead to bronchitis or pneumonia
4. Both A and B
5. None of the above

The explosive range of CO is \_\_\_\_\_\_ percent.

1. 12.5 to 72.4
2. 12.5 to 15.0
3. 12.5 to 51.4
4. 12.5 to 74.2

The specific gravity of a gas is its weight in relation to an equal amount of oxygen under the same temperature and pressure.

1. True
2. False

Your team is about to enter a mine containing “iron pyrite”, you know a fire is burning, you should check for:

1. carbon dioxide
2. hydrogen sulfide
3. sulfur dioxide
4. oxides of nitrogen

High nitrogen dioxide readings could indicate:

1. There has been a fire or explosion
2. Malfunctioning electrical equipment producing arcs or sparks
3. Inadequate ventilation of diesel equipment
4. All of the above
5. None of the above

The explosive range of butane is:

1. 4.0 to 74.2%
2. 2.12 to 9.35%
3. 1.86 to 8.41%
4. 5 to 15%
5. None of the above

Oxygen deficiency causes tightness in forehead, headaches, and dizziness at \_\_\_\_\_\_\_\_\_\_.

1. 14%
2. 13%
3. 15%
4. 9%

When the barometer rises, a gas like CH4 would

1. Expand
2. Contract
3. Defuse
4. None of the above

There are four main causes of oxygen deficiency in a mine which one of the following is not a main cause.

1. Insufficient or improper ventilation which fails to bring enough O2 to the work area
2. Displacement of the air’s O2 by other gases
3. A fire or explosion that consumes O2
4. Consumption of O2 by workers
5. Consumption of O2 by diesel equipment

Hydrogen Sulfide is most explosive at \_\_\_\_\_\_\_\_\_ percent.

1. 7 to 8
2. 5.9
3. 14.2
4. 15
5. None of the above

\_\_\_\_\_\_\_\_\_ has a slight garlic odor.

1. Propane
2. Acetylene
3. Butane
4. Both A and C
5. None of the above

High NO2 readings in the absence of a fire, blasting or electrical arcing could be an indication of:

1. strata gas emissions.
2. decomposition of halogenated hydrocarbons.
3. use of organic solvents and/or spray paint.
4. inadequate ventilation.

Category No. 3 – VENTILATION

Usually, the measured distance using a smoke tube is \_\_\_\_ feet

1. 100
2. 50
3. 75
4. 25

A medium velocity anemometer measures velocities from \_\_\_\_\_\_\_ feet per minute.

* 1. 500 – 1000
  2. 120 - 2000
  3. 100 - 1500
  4. None of the above

When barometric pressure is high,

* 1. Pressure on gas is reduced
  2. Gas diffuses more quickly
  3. It is easier for concentrations of explosive gas to build up.
  4. All of the above
  5. None of the above

Copper tubes or pipes are inserted in temporary and permanent bulkheads for the purpose of:

* 1. Checking for smoke
  2. Bleeding off excess pressure from the sealed area
  3. Collecting air samples from the sealed area
  4. Ventilating the sealed area

\_\_\_\_\_\_\_\_\_\_ ventilation is the most common method of recovery in multi-level mines.

* 1. Direct
  2. Progressive
  3. Indirect
  4. Automatic
  5. None of the above

The difference in pressure within and without a sealed area usually described as “breathing in” means:

* 1. Positive pressure in sealed area
  2. Negative pressure in sealed area
  3. Positive pressure outside sealed area
  4. Negative pressure outside sealed area
  5. None of the above

A smoke tube is used to determine slow moving air usually air moving less than

* 1. 200 cfm
  2. 175 cfm
  3. 150 cfm
  4. 120 cfm
  5. None of the above

A medium velocity vane type anemometer is used to measure ventilation through a heading that is 20 feet wide by 10 feet high. The anemometer reading is 145 feet, and the reading was taken over a period of 1 minute. The anemometer correction factor is +5. What is the airflow through the heading?

* 1. 30,000 cfm
  2. 29,000 cfm
  3. 30,450 cfm
  4. 33,000 cfm

Category No. 4 – EXPLORATION

As you explore, keep in mind that your first priority is finding survivors.

* 1. True
  2. False

The third priority as you explore a mine is the recovery of the mine.

* 1. True
  2. False

Prior to rescue team exploration, the first step to take after a disaster is to:

1. Examine all mine openings
2. Establish a fresh air base
3. Proceed as far as possible into the mine without apparatus
4. None of the above

\_\_\_\_\_\_\_\_\_\_ is the process by which a team systematically explores all crosscuts and adjacent entries as they advance so they are never forward of an unexplored area.

1. Cross checking
2. Tying in
3. Traveling
4. Pacing
5. None of the above

During exploration, a mine rescue team finds a sliding door regulator in the fully open position, however, the mine map indicates it should be in the fully closed position. What should the team do?

1. Close the door.
2. Leave the door open.
3. Slide the door to the half-closed position.
4. Report the condition and close the door if directed to do so by the command center.

When a mine rescue team is exploring a mine, the main fan should be:

1. shut down, locked out and guarded.
2. shut down and guarded.
3. operated continuously.
4. Shut down, locked out, checked for damage, and repaired if necessary so it will be ready to start up when needed.

During exploration, a mine rescue team’s first priority is:

1. finding survivors
2. mapping all features and conditions found by the team
3. locating and regulating or sealing all fires
4. all of the above
5. none of the above

Before going through a ventilation control while exploring the mine, the team should try to determine the conditions on the other side by:

* + 1. calling out to anyone who might be present on the other side.
    2. conducting gas tests on the other side of the control to measure the atmosphere.
    3. traveling to the other side via an alternative route that bypasses the ventilation control.
    4. feeling the control for heat and looking for smoke.
    5. both b and d

When a mine rescue team goes underground to explore or fight a fire, it should be concerned with two main things - - spreading of the fire, and:

1. spreading of smoke and combustion gases by the ventilation system.
2. location and condition of survivors.
3. availability of fire fighting supplies and equipment.
4. possibility of an explosion.

Category No. 5 – BODIES & SURVIVORS

There will probably be no decay odor for the first \_\_\_\_ hours following death.

1. 3 to 4
2. 2 to 3
3. 24 to 48
4. 4 to 8

Survivors can be categorized into three priority groups according to their condition or injuries. Examples of first priority conditions include:

1. Fractured arm, hand, or foot
2. Mild heat exhaustion
3. Severe bleeding
4. All of the above
5. None of the above

Survivors can be categorized into three priority groups according to their condition or injuries. An example of the third priority condition is:

1. Mild hysteria
2. Moderate Shock
3. Severe head injuries
4. All of the above
5. None of the above

Which of the following statements pertaining to body deterioration and the changes that occur is incorrect?

1. A body at freezing temperatures can be preserved for weeks.
2. A body at 75°F or higher will decay very rapidly.
3. How quickly the body begins to decay will depend on the temperature in the area.
4. After death, the body goes through various changes and stages of decay.

Category No. 6 – SCBA

If you wear your self-contained breathing apparatus in petroleum based fumes for prolonged or successive periods, the fumes can eventually permeate its rubber parts so that the apparatus no longer provides you with adequate protection.

* + 1. True
    2. False

My mine rescue closed circuit breathing apparatus does not use AIR in the cylinder because:

* + 1. Air does not have any oxygen
    2. Air has too much CO2
    3. The manufacturer specifies Oxygen
    4. Air has 21% oxygen by volume, & for Closed-Circuit apparatus that is not enough
    5. Both C & D

What will result in the BEST cooling of breathing gasses:

* + 1. Install the gel tube/ice canister just prior to donning
    2. Install the gel tube/ice canister during benching back at the rescue station
    3. Do not use the gel tube/ice canister at all.
    4. Use only partially frozen gel tube/ice canister

Under extremely heavy work conditions, if the user inhales and collapses the diaphragm as far as it can travel, it activates the

* + 1. By-Pass Valve
    2. Demand Valve
    3. Relief Valve
    4. Check Valve

What specifically controls the directional flow of the breathing gasses:

* + 1. The hoses
    2. The mask
    3. The breathing bag or chamber
    4. The CO2 scrubber/absorber
    5. The check valves

Max drying temperature is \_\_\_ degrees F .

* + 1. 120
    2. 114
    3. 140
    4. 130

According to Federal regulations, a self contained breathing apparatus must be tested at intervals not exceeding:

* + 1. 30 days
    2. 45 days
    3. 60 days
    4. 90 days

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Category No. 7 – MINE DAMPS

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a mixture of methane and air that will burn or explode when ignited.

1. Blackdamp
2. Afterdamp
3. Stinkdamp
4. Whitedamp
5. Firedamp

\_\_\_\_\_\_\_\_\_\_\_\_ is a mixture of carbon monoxide and air which results from a mine fire.

1. Afterdamp
2. Firedamp
3. Whitedamp
4. Blackdamp

What is the most poisonous gas found in “afterdamp”?

1. Carbon monoxide
2. Carbon dioxide
3. Methane
4. Nitrogen
5. Hydrogen

Which of the following is not a constituent of blackdamp?

1. Carbon dioxide
2. Carbon monoxide \*
3. Nitrogen
4. Air which is oxygen deficient

This gas is the principle constituent of stink damp

1. Carbon monoxide
2. Hydrogen dioxide
3. Hydrogen sulfide
4. Sulfur dioxide

Category No. 8 – POTPOURRI or MISHMASH

In sealing a mine it is recommended that:

1. Only permanent bulkheads be used
2. The last intake and last exhaust be sealed simultaneously
3. A single air sample tube be used
4. All of the above

Team members should not drink alcoholic beverages for at least \_\_\_\_\_\_\_\_ hours before getting under oxygen.

1. 8 to 10
2. 24
3. 12 to 18
4. 6
5. None of the above

This mapping symbol ( - - - - -) is used to indicate what?

1. Foot prints
2. Proposed areas of development
3. Line brattice
4. Water

This mapping symbol ( D ) is used to indicate what?

1. Drainage
2. Damage
3. Door
4. Date and time

MSHA Forms 5000-3 must be kept on file for a period of

1. 1 year
2. 2 years
3. 3 years
4. 5 years
5. None of the above

During a rescue and recovery operation, one of the duties of the outside Supervisor is to:

1. Arrange for guards and state and/or local police.
2. Notify all persons on the notification plan of the emergency.
3. Provide materials for additional telephone communications as needed.
4. Obtain gas samples from the main exhaust.
5. None of the above

“Spatial disorientation” occurs when:

1. the team becomes lost due to errors on the mine map provided to the team.
2. dense smoke obscures the back, sides, and other reference points.
3. a team member becomes faint or “light headed” due to physical exhaustion or heat exhaustion.
4. none of the above.

Phosgene gas can be produced by the burning of rubber, neoprene, or PVC. What is the maximum allowable concentration of phosgene?

1. 0.000001 %
2. 0.00001 %
3. 0.0001 %
4. 0.001 %
5. none of the above