Mine Gases General Review
(Pages 2-49 thru 2-51)

Choose the correct answer to each of the following questions:

1. Normal air contains approximately what percent oxygen?
   a. 15%
   b. 21%
   c. 31%
   d. 79%

2. The explosive range of a methane/air mixture (normally 5-15%) will change if:
   a. certain other combustible gases are present.
   b. coal dust is suspended in the atmosphere.
   c. there is less than 12.1% oxygen in the atmosphere.
   d. all of the above.

3. Carbon monoxide is:
   a. a gas found in all mining operations
   b. a normal constituent of air
   c. detected during a mine fire or explosion
   d. a product of the breathing process

4. An elevated concentration of carbon dioxide in mine air can be harmful because:
   a. it is highly explosive
   b. it increases the breathing rate
   c. it is highly toxic in small concentrations
   d. all of the above

5. An elevated concentration of nitrogen in mine air can be harmful because:
   a. it can lower the oxygen content of the air
   b. it is highly explosive
   c. it is highly toxic
   d. all of the above

6. Oxides of nitrogen can occur in a mine atmosphere:
   a. when certain explosives are used
   b. when diesel-powered equipment is being used
   c. when electric equipment produces arcs or sparks
   d. all of the above
7. Accumulations of hydrogen in the mine atmosphere are dangerous because hydrogen:
   a. is highly toxic
   b. is highly soluble in water
   c. is highly explosive
   d. gives off a suffocating odor

8. Characteristics of hydrogen sulfide include:
   a. explosive
   b. highly toxic
   c. can be liberated from pools of stagnant water
   d. all of the above

9. Which of the following is not true of sulfur dioxide?
   a. it is explosive
   b. it is highly toxic
   c. it is highly soluble in water
   d. it can occur during mine fires

10. The most likely source of ethane, propane, or butane in a mine is:
    a. use of diesel equipment
    b. battery charging stations
    c. leakage from adjacent gas or oil wells
    d. all of the above

11. Acetylene would normally be found in a mine atmosphere where:
    a. diesel equipment is used
    b. methane has burned or exploded in air with a lowered oxygen content
    c. leakage has occurred from adjacent oil or gas wells
    d. battery charging stations are located

12. Match each damp with its components:
    1. Firedamp    a. Carbon monoxide and air
    2. Blackdamp   b. Hydrogen sulfide and air
    3. Afterdamp   c. Carbon dioxide, nitrogen, and air
    4. Whitedamp   d. Carbon monoxide, carbon dioxide, methane, oxygen, nitrogen, and hydrogen
    5. Stinkdamp   e. Methane and air
13. Mine rescue teams are required by Federal law to have available:
   a. one detecting device for every gas listed as dangerous by the
      U. S. Bureau of Mines
   b. one detecting device for each gas normally encountered in the mine(s) the
      team serves
   c. four detecting devices for each gas normally encountered in the mine(s) the
      team serves
   d. one detecting device for each team member

14. Atmospheric pressure and temperature are important factors because they:
   a. affect the rate of diffusion of a gas by ventilation
   b. can cause false readings on gas detection instruments
   c. lower oxygen content in the mine
   d. all of the above

15. Two gases that are highly soluble in water are:
   a. methane and acetylene
   b. hydrogen sulfide and hydrogen
   c. nitrogen and sulfur dioxide
   d. hydrogen sulfide and sulfur dioxide

16. A gas that is normally found near the roof or in high places in the mine is said
    to have a low:
   a. level of toxicity
   b. level of explosivity
   c. specific gravity
   d. level of solubility

17. The amount of coal dust suspended in the mine atmosphere is most important
    because:
   a. it can alter the explosive range of methane.
   b. it can affect the specific gravity of oxygen.
   c. hydrogen is liberated from the coal dust.
   d. coal dust lowers the oxygen content in the mine atmosphere.

18. A nontoxic gas can still be dangerous because it can:
   a. displace oxygen
   b. burn
   c. explode
   d. all of the above

19. The type of coal mine where the greatest amount of methane would be likely to be
    found would be a:
   a. drift mine with tight and compact adjoining strata
   b. drift mine with loose or broken adjoining strata
   c. shaft mine with tight and compact adjoining strata
   d. shaft mine with loose or broken adjoining strata
20. Gases that are neither toxic nor explosive:
   a. are not found in mine atmospheres
   b. are not dangerous
   c. can be dangerous because they can displace oxygen
   d. cannot be detected with today’s detection instruments
GENERAL REVIEW ANSWER KEY (IG XX pages 2-52)

1. b  7. c  12.  
2. d  8. d  1) e  
3. c  9. a  2) c  
4. b  10. c  3) d  
5. a  11. b  4) a  
6. d  

13. c  
14. a  
15. d  
16. c  
17. a  
18. d  
19. c  
20. c