2023 Kansas Shoot-out Mine Rescue Competition
Hutchinson, Kansas
Written Test – Technician Team

1) 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 Solubility.
   b) Specific Gravity. (IG 115, Pg. 2-34)
   c) Level of toxicity.

2) Atmospheric pressure and Temperature are important factors because they:

   a) Affect the rate of diffusion of a gas by ventilation. (IG 115, Pg. 2-33)
   b) Can cause false reading on gas detection instruments.
   c) Lower oxygen content in the mine.

3) For mining applications, velocity is always measured in _____ .

   a) Feet per minute. (IG 115, Pg. 3-32)
   b) Feet per second.
   c) Meters per minute.

4) The recommended calibration procedure on the MX6 iBird multi-gas detector should be:

   a) Before each use.
   b) Once a month.
   c) Before each use and monthly thereafter. (MX6 iBird Manual, Pg. 12)

5) A smoke tube is a device used to:

   a) Determine oxygen content of the mine atmosphere.
   b) Determine direction and velocity of airflow. (IG 115, Pg. 3-27)
   c) Detect leaks in temporary stoppings/bulkheads.

6) The types and readings of all installed sensors of the MX6 iBird are displayed in_____.

   a) Battery Status
   b) Normal Operation Mode (MX6 iBird Manual, Pg. 17)
   c) Startup Self-Test

7) A medium-velocity (or "regular") anemometer is used for measuring velocities from 120 to _____ feet per minute.

a) 2,000 (IG 115, Pg. 3-31)
b) 6,800
c) 4,000

8) Prior to each day's use of the MX6 iBird Multi-gas Monitor, a bump test should be performed. If the instrument does not pass the bump test:

a) Bump test again
b) A full calibration is recommended. (MX6 iBird Manual, Pg. 12)
c) Send it to the manufacture.

9) Mine rescue teams erecting temporary stoppings/Bulkheads in atmosphere with elevated methane readings should:

a) Leave a corner of the stopping/Bulkhead open for the methane to exit.
b) Mine Rescue teams should never enter such atmosphere.
c) Use non-sparking tools, nails, and spads. (IG 115, Pg. 3-27)

10) An elevated concentration of nitrogen in mine air can be harmful because:

a) It can lower the oxygen content of the air. (IG 115, Pg. 2-31)
b) It is highly explosive.
c) It is highly toxic.

11) Temporary stoppings/bulkheads built in a passageway should be placed at least 4 to 6 feet into the passageway in order that:

a) A sufficient amount of space is available to construct a permanent stopping/bulkhead. (IG 115, Pg. 3-28)
b) It will be protected from further explosions.
c) It will not be affected by fire if a fire should spread to that crosscut.

12) Methane is flammable, its explosive range is 5 to 15 percent when there is at least ____ percent oxygen.

a) 10.8 (IG 115, Pg. 2-31)
b) 13.2
c) 7.8

13) 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. (IG 115, Pg. 2-32)

14) 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. (IG 115, Pg. 2-34)

15) Two instruments commonly used to measure velocity of airflow in a mine are:

a) Smoke tube and an anemometer. (IG 115, Pg. 3-28)
b) Smoke tube and CO detector.
c) High velocity and medium velocity anemometer.