

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. An organic substance is one that:
  - A) occurs naturally.
  - B) contains carbon.
  - C) is produced by living organisms.
  - D) can react with oxygen.
  
2. What is the term for compounds that are capable of vaporizing into the atmosphere under normal environmental conditions?
  - A) Volatile organic compounds
  - B) Ambient-reactive compounds
  - C) Highly soluble liquids
  - D) Monomeric liquids
  
3. Which instrument gives real-time measurements of organic vapors or mists in very low concentrations?
  - A) Flame ionization detector (FID)
  - B) Gas chromatography (GC)
  - C) Photo-ionization detector (PID)
  - D) Gas spectrometer
  
4. Which instrument can be used to identify the components of a mixed air sample that may contain several different chemicals?
  - A) Ionic vapor detector
  - B) Gas chromatography (GC)
  - C) Photo-ionization detector (PID)
  - D) Raman spectroscope
  
5. The reagent in \_\_\_\_\_ will undergo a particular color change when exposed to the contaminant it is designed to detect.
  - A) a colorimetric tube
  - B) gas chromatography (GC)
  - C) a Fourier Transform Infrared spectroscope
  - D) a mass spectrometer

6. Which device is designed solely to detect flammable or explosive atmospheres?
- A) Combustible gas indicator
  - B) Vapor ionization detector
  - C) Ionic vapor detector
  - D) Colorimetric tube
7. A \_\_\_\_\_ is a versatile detection device typically equipped with a combination of toxic gas sensors and the ability to detect flammable gases and vapors.
- A) combustible gas indicator
  - B) vapor ionization detector
  - C) multi-gas meter
  - D) colorimetric tube
8. What is used to measure the pH of corrosive liquids and gases?
- A) Colorimetric tube
  - B) Chemical test strips
  - C) Reagent strips
  - D) Litmus paper
9. A \_\_\_\_\_ is clipped to a front shirt pocket and measures exposure to a specific contaminant.
- A) chemical test strip
  - B) specialized detection device
  - C) specific sampling card
  - D) personal dosimeter
10. This detection device is dipped into an unknown liquid, allowing the chemical to come into contact with several small “windows,” each with specific reagents designed to identify the presence of different chemical classifications.
- A) General assay kit
  - B) Chemical test strip
  - C) Broad-spectrum sampling paper
  - D) Litmus paper
11. Which statement about detection/monitoring devices is correct?
- A) The multi-gas meter has replaced most other detection equipment.
  - B) Misinterpreted monitor readings can result in poor decisions.
  - C) The device's features determine how the device fits into your operational plan.
  - D) Most modern detectors are designed so that service can be performed in-house.

12. What is the term for observing and understanding the visual cues available and using that information to orient yourself and make rapid decisions about your current situation?
- A) Size-up
  - B) Incident action plan (IAP)
  - C) Strategy
  - D) Situational awareness
13. Situational awareness begins with:
- A) knowing your objective and your tactics.
  - B) obtaining information about the situation.
  - C) maintaining a manageable span of control.
  - D) establishing a clear chain of command.
14. Of the 10 basic rules for detection and monitoring, which comes first?
- A) Develop an overall monitoring plan.
  - B) Confirm all readings are obtained and recorded when appropriate.
  - C) Properly prepare the instrument for use.
  - D) Prioritize your monitoring areas.
15. Of the 10 basic rules for detection and monitoring, which comes first?
- A) Select the proper personal protective equipment (PPE) for the task.
  - B) Research and understand the nature of any identified atmospheric contamination.
  - C) Attempt to identify the source and nature of potential contamination prior to entry.
  - D) Select the appropriate instrument(s) for the task.
16. Which procedure ensures that a particular instrument will detect the gas or vapor it is intended to detect at a certain level?
- A) Calibration
  - B) Standardization
  - C) Fresh-air setup
  - D) Bump test
17. What is the term for a quick field test to ensure that a gas detector will detect the gases it is intended to?
- A) Calibration
  - B) Quick check
  - C) Fresh-air setup
  - D) Bump test

18. Which test involves releasing a gas near the inlet port of a monitor/detector to see if the device detects it correctly?
- A) Fresh-air setup
  - B) Alarm check
  - C) Bump test
  - D) Calibration
19. The time it takes for a gas detector to draw in an air sample, process the sample, and give a reading is the \_\_\_\_\_ time.
- A) lag
  - B) reaction
  - C) detection
  - D) processing
20. The \_\_\_\_\_ time of a gas detector is how much time it takes it to clear a reading so a new reading can be taken.
- A) response
  - B) recovery
  - C) clearing
  - D) reset
21. Which item is required to zero a gas detector?
- A) Calibration gas
  - B) Bump gas
  - C) Zeroing gas
  - D) Clean atmosphere
22. A gas monitor is sampling a combustible gas for which it has not been calibrated. Which statement about this situation is correct?
- A) Measurements and alarms will not be affected.
  - B) The monitor will go into alarm mode regardless of the concentration.
  - C) Accurate readings can be obtained through the use of a correction factor.
  - D) The monitor will not be useful in this situation.
23. What function does the relative response factor perform?
- A) Corrects readings for differing combustible gases
  - B) Reduces recovery time
  - C) Makes it possible to zero the sensors
  - D) Adjusts for differences in ambient pressures

24. When performing atmospheric monitoring of a building, where should you start?
- A) Around the outside of the building
  - B) At the point of entry
  - C) At the lowest part of the building
  - D) At the highest part of the building
25. Which is a hazard unique to Raman spectroscopy?
- A) Exposure to isotope
  - B) Static electricity is generated.
  - C) Close proximity to the sample material is required.
  - D) Laser-induced eye damage
26. Which type of gas detector operates by using an ultraviolet light lamp to break down the sample gas into electrically charged particles, which produce a current that is amplified and displayed by the instrument?
- A) Transform infrared spectroscopy
  - B) Ionization detector
  - C) Gas chromatography
  - D) Photo-ionization detector
27. What does VOC stand for?
- A) Vessel overturn cage
  - B) Volatile organic compound
  - C) Viable operational command
  - D) Vapor outlet control
28. Most combustible-gas indicators begin to alarm when the concentration of combustible gas reaches what level?
- A) 100% of the LEL/LFL
  - B) 10% of the UEL/UFL
  - C) 10% of the LEL/LFL
  - D) 100% of the UEL/UFL
29. Which factor complicates the use of a combustible gas indicator?
- A) The instrument is calibrated for only one specific gas.
  - B) Readings must be corrected for altitude.
  - C) Flammable limits for a specific gas can vary significantly.
  - D) The instrument can sense only one specific gas.

30. What is the minimum concentration of atmospheric oxygen necessary for a combustible gas indicator to function properly?
- A) 10%
  - B) 15%
  - C) 17%
  - D) 19.5%
31. Which technique can identify the various components of a gas mixture, but not the amounts of each component?
- A) Gas chromatography
  - B) Ionization detector
  - C) Transform infrared spectroscopy
  - D) Photo-ionization detector
32. Which instrument uses a tiny hydrogen flame to break down a sample gas into electrically charged particles to determine the concentration of each component of the gaseous mixture?
- A) Raman spectroscopy
  - B) Flame ionization detector
  - C) Transform infrared spectroscopy
  - D) Gas chromatography
33. Ambient air at sea level contains \_\_\_\_\_% oxygen.
- A) 18
  - B) 19.5
  - C) 20.9
  - D) 23.5
34. An oxygen-deficient atmosphere is defined as an oxygen concentration below \_\_\_\_\_%.
- A) 18
  - B) 19.5
  - C) 20.9
  - D) 23.5
35. An oxygen-enriched atmosphere is defined as an oxygen concentration above \_\_\_\_\_%.
- A) 18
  - B) 19.5
  - C) 20.9
  - D) 23.5

36. What is the primary toxic effect of carbon monoxide?
- A) Interferes with the blood's ability to carry oxygen
  - B) Inhibits cellular metabolism and reproduction
  - C) Disrupts transmission of nervous system impulses
  - D) Directly toxic to liver and kidney tissue
37. What is the minimum concentration of carbon monoxide at which all emergency personnel should wear SCBA?
- A) 35 ppm
  - B) 475 ppm
  - C) 1000 ppm
  - D) 2000 ppm
38. What is the most commonly encountered source of carbon monoxide?
- A) Decomposing organic materials
  - B) Combustion
  - C) Hydrocarbon liquid vapors
  - D) Endothermic chemical reactions
39. Which gas is sometimes referred to as “sewer gas”?
- A) Sulfur dioxide
  - B) Hydrogen cyanide
  - C) Hydrogen sulfide
  - D) Carbon dioxide
40. Which statement about carbon monoxide is correct?
- A) It has the odor of sour milk.
  - B) It tends to settle in low areas.
  - C) It is visible under some circumstances.
  - D) It has a wide flammable range.
41. Which statement about hydrogen sulfide is correct?
- A) It is usually the product of incomplete combustion.
  - B) It tends to rise and dissipate.
  - C) It blocks the cells from using oxygen.
  - D) It can be reliably detected by odor.

42. A typical four-gas monitor checks for which of the following?
- A) Fluorine
  - B) Chlorine
  - C) Carbon dioxide
  - D) Hydrogen sulfide
43. Which statement about electrochemical sensors is correct?
- A) They eliminate the need for bump testing.
  - B) They are considered an unreliable technology.
  - C) Exposure to some gases may result in false readings.
  - D) Shelf life is indefinite, depending on frequency of use.
44. Which type of gas detector uses a hand-powered bellows pump to draw a sample?
- A) Colorimetric tube
  - B) Vapor ionization detector
  - C) Combustible gas indicator
  - D) Multi-gas monitor
45. What does pH measure?
- A) The relative strength of an oxidizer
  - B) The concentration of hydrogen ions
  - C) The tendency of a material to react with other materials
  - D) The relative volatility of a material
46. What is a neutral pH?
- A) 0
  - B) 1
  - C) 5
  - D) 7
47. Which pH is acidic?
- A) 2
  - B) 7
  - C) 9
  - D) 10



48. A material with a pH of \_\_\_\_\_ is the most corrosive.
- A) 5
  - B) 7
  - C) 9
  - D) 12
49. What is a spectra?
- A) An infrared radiation source
  - B) A radiation detection device
  - C) A material's unique molecular fingerprint
  - D) A broad-spectrum laser
50. What special capability does Fourier Transform Infrared spectroscopy provide?
- A) Specific identification of many substances by name
  - B) Measurement of the percentage LEL for any flammable gases
  - C) Liquid, mist, dust, and gas sampling
  - D) Nondestructive sampling
51. A person has a radioactive material on their clothing. What is the term for this?
- A) Exposure
  - B) Contamination
  - C) Absorption
  - D) Contact

## Answer Key

1. B
2. A
3. C
4. B
5. A
6. A
7. C
8. D
9. D
10. B
11. B
12. D
13. B
14. D
15. C
16. A
17. D
18. C
19. B
20. B
21. D
22. C
23. A
24. A
25. D
26. D
27. B
28. C
29. A
30. A
31. A
32. B
33. C
34. B
35. D
36. A
37. A
38. B
39. C
40. D
41. C
42. D
43. C
44. A

- 45. B
- 46. D
- 47. A
- 48. D
- 49. C
- 50. A
- 51. B