

## Total Question: 50 QAs

Question No: 1

Butane is

- A. a carboxylic acid with 1 carbon atom.
- B. an alcohol with 2 carbon atoms.
- C. an aldehyde with 3 carbon atoms.
- D. an alkane with 4 carbon atoms.

Answer: D

Explanation: Butane is an alkane with 4 carbon atoms. A carboxylic acid with 1 carbon atom (Choice A) is known as methanoic acid or formic acid; an alcohol with 2 carbon atoms (Choice B) is known as ethanol; and an aldehyde with 3 carbon atoms (Choice C) is known as propanal. Each of these substances is named for the number of carbon atoms that the substance contains and the functional group of the compound in which the substance is found. In other words, the prefix (meth-, eth-, prop-, but-, pent-, etc.) represents the number of carbon atoms in the substance (meth- = 1, eth- = 2, prop- = 3, but- = 4, and so on); and the suffix represents the compound type (-ane = alkane, -anoic acid or -oic acid = carboxylic acid, -ol = alcohol, and -al = aldehyde).

Question No: 2

The flashpoint of a substance is

- A. the temperature at which a liquid will begin to evaporate and form a gas.
- B. the temperature at which a liquid will begin to produce a sufficient amount of vapor to cause a fire if there is both an ignition source and air present.
- C. the temperature at which a solid will begin to liquefy.
- D. the temperature at which a substance will cause a fire without an ignition source if there is air present.

Answer: B

Explanation: The flashpoint of a substance is the temperature at which a liquid will begin to produce a sufficient amount of vapor to cause a fire if there is both an ignition source and air present. The temperature at which a liquid will begin to evaporate and form a gas (Choice A) is known as the liquid's boiling point. The temperature at which a solid will begin to liquefy (Choice C) is known as the substance's melting point. The temperature at which a substance will cause a fire without an ignition source if there is air present (Choice D) is known as an auto-ignition temperature. It is important to note that the flashpoint of a substance is the temperature at which the substance's vapors will ignite with an ignition source, but the auto-ignition temperature is the temperature at which a substance will ignite without an ignition source.

Question No: 3

According to the Environmental Protection Agency (EPA), a substance should be considered a delayed health hazard if the substance may

- A. cause an individual to experience an adverse effect after the individual has been exposed to the substance for a long period of time.
- B. cause an individual to experience an adverse effect after the individual has been exposed to the substance for a short period of time.
- C. cause a potentially dangerous chemical reaction after it is exposed to another substance such as air or

water.

D. cause a fire to occur, cause a fire to burn longer, or cause a fire to burn more violently than it would typically be able to burn without the substance.

Answer: A

Explanation: According to the Environmental Protection Agency (EPA), a substance should be considered a delayed health hazard if the substance may cause an individual to experience an adverse effect after the individual has been exposed to the substance for a long period of time. A substance that may cause an individual to experience an adverse effect after the individual has been exposed to the substance for a short period of time (Choice B) is known as an immediate health hazard or an acute health hazard. A substance that may cause a potentially dangerous chemical reaction after it is exposed to another substance such as air or water (Choice C) is known as a reactive hazard. A substance that may cause a fire to occur, cause a fire to burn longer, or cause a fire to burn more violently than it would typically be able to burn without the substance (Choice D) is known as a fire hazard.

Question No: 4

The U.S. Department of Transportation (DOT) defines a combustible substance as

A. a substance with a flashpoint of no more than 60°C or 140°F.

B. a substance with a flashpoint of more than 60°C or 140°F, but less than 93°C or 200°F.

C. a mixture that contains a substance with a flashpoint of more than 60°C or 140°F that has been mixed with a substance with a flashpoint of less than 60°C or 140°F when the mixture is transported at a temperature less than the flashpoint of both substances.

D. a substance with a flashpoint of more than 93°C or 200°F.

Answer: B

Explanation: The U.S. Department of Transportation defines a combustible substance as a substance with a flashpoint of more than 60°C or 140°F, but less than 93°C or 200°F. A substance with a flashpoint of no more than 60°C or 140°F (Choice A) is considered to be a flammable substance. A mixture that contains a substance with a flashpoint of no more than 60°C or 140°F that has been mixed with a substance with a flashpoint of less than 60°C or 140°F when the mixture is transported at a temperature less than the flashpoint of both substances (Choice C) is actually an exception to the Department of Transportation (DOT)'s typical definition of a flammable substance. This mixture, as a result, is considered nonflammable as long as it is transported at a temperature lower than its flashpoint. A substance with a flashpoint of more than 93°C or 200°F (Choice D) is considered to be a nonflammable substance.

Question No: 5

Determine the volume of 0.5M sodium bicarbonate ( $\text{NaHCO}_3$ ) that an individual would need to neutralize 1 L of 0.1M phosphoric acid ( $\text{H}_3\text{PO}_4$ ),

A. 0.2 mL

B. 50 mL

C. 200 mL

D. 600 mL

Answer: D

Explanation: An individual would need 600 mL of 0.5M sodium bicarbonate to neutralize 1 L of 0.1M phosphoric acid. First determine how many moles of acid you have. A 1 L solution of acid at 0.1 M contains 0.1 moles of acid. Next determine how many moles of sodium bicarbonate are needed to neutralize this much

acid. Each phosphoric acid molecule requires 3 molecules of sodium bicarbonate to neutralize it. This means that 0.3 moles of sodium bicarbonate are needed. The base solution has a concentration of 0.5M, so the amount required for neutralization can be calculated as  $0.3 \text{ moles} / 0.5 \text{ M} = 0.6 \text{ L}$  or 600 mL.

Question No: 6

A pressure of 3 bars is equal to approximately

- A. 2.2128 foot-pounds.
- B. 14.5 pounds of force/square inch.
- C. 25.0359 pounds.
- D. 43.5 pounds of force/square inch.

Answer: D

Explanation: A pressure of 3 bars equals to approximately 43.5 pounds of force/square inch (14.5 pounds of force/square inch per bar \* 3 bars = 43.5 pounds of force/square inch). A pressure of 2.2128 foot-pounds (Choice A) equals approximately 3 joules of energy (0.7376 foot-pounds per joule \* 3 joules = 2.2128 foot-pounds). A pressure of 14.5 pounds of force/square inch (Choice B) equals 1 bar. 25.0359 pounds (Choice C) is the approximate weight of 3 gallons of water (8.3453 pounds per gallon \* 3 gallons = 25.0359 pounds). It is important to note that the answers offered by Choices A and C do not actually refer to units that are used to measure pressure, but instead refer to units that are used to measure work (Choice A) or weight (Choice C).

Question No: 7

What is systemic sampling?

- A. A sample collection strategy in which an individual determines the locations from which he or she will collect samples by using a program or table that lists the locations at random
- B. A sample collection strategy in which an individual determines the locations from which he or she will collect samples by using a system that identifies specific locations throughout the area where the individual can collect samples from on a regular basis
- C. A sample collection strategy in which an individual determines the locations from which he or she will collect samples based on information about the areas that have been contaminated in the past and the areas that now appear to be contaminated
- D. A sample collection strategy in which an individual collects samples from convenient locations without any apparent system

Answer: B

Explanation: Systemic sampling is a sample collection strategy in which an individual determines the locations from which he or she will collect samples by using a system that identifies specific locations throughout the area where the individual can collect samples on a regular basis. A sample collection strategy in which an individual determines the locations from which he or she will collect samples by using a program or a table that lists the locations at random (Choice A) is known as random sampling or simple random sampling. A sample collection strategy in which an individual determines the locations from which he or she will collect samples based on information about the areas that have been contaminated in the past and the areas that now appear to be contaminated (Choice C) is known as judgmental sampling. A sample collection strategy in which an individual collects samples from convenient locations without any apparent system (Choice D) is known as haphazard sampling.

Question No: 8

What is a sampling plan?

- A. A series of objectives and procedures that an individual or an organization can use to ensure that all of the samples that the individual or organization collects are collected and analyzed properly
- B. The objectives that the individual or organization attempts to achieve by collecting samples
- C. The amount of reliability that the individual or organization realistically hopes to achieve in regards to the information that the individual or organization collects
- D. The reports that the individual or organization intends to generate from the information that the individual or organization collects

Answer: A

Explanation: A sampling plan is a series of objectives and procedures that an individual or an organization can use to ensure that all of the samples that the individual or organization collects are collected and analyzed properly. Choices B, C, and D all refer to the information that is typically included in a sampling plan. The objectives that the individual or organization attempts to achieve by collecting samples (Choice B) are known as Data Use Objectives (DUO). The amount of reliability that the individual or organization realistically hopes to achieve (since most individuals and/or organizations would like to collect information that is 100% reliable, which rarely happens) in regards to the information that the individual or organization collects (Choice C) is known as the individual's or organization's quality assurance objectives. The reports that the individual or organization intends to generate from the information collected (Choice D) are known as deliverables.

Question No: 9

The amount of a substance that an individual must be exposed to in a single dose for that exposure to prove fatal at least 50% of the time is known as the

- A. threshold dose.
- B. median effective dose.
- C. median lethal concentration.
- D. median lethal dose.

Answer: D

Explanation: The amount of a substance that an individual must be exposed to for that exposure to prove fatal at least 50% of the time is known as the median lethal dose or the LD50 (which refers to the lethal dose for 50%). The threshold dose (Choice A) is the smallest amount of a substance that an individual may be exposed to before that substance will cause an individual to experience a specific effect. The median effective dose (Choice B), which is also known as the ED50 (which refers to the effective dose for 50%), is the amount of a substance that an individual must be exposed to for that exposure to cause a specific effect at least 50% of the time. The median lethal concentration (Choice C), which is also known as the LC50 (which refers to the lethal concentration for 50%), is the amount of a substance that an individual must be exposed to in multiple doses for that substance to prove fatal at least 50% of the time.

Question No: 10

A risk assessment procedure in which an individual or an organization attempts to examine the different ways that an individual may be exposed to a substance is known as

- A. a dose-response assessment.
- B. an exposure assessment.
- C. hazard identification.

D. risk characterization.

Answer: B

Explanation: A risk assessment procedure in which an individual or an organization attempts to examine the different ways that an individual may be exposed to a substance is known as an exposure assessment. A dose-response assessment (Choice A) is a risk assessment procedure in which an individual or an organization attempts to determine the smallest amount of a substance that an individual may be exposed to before that substance will cause a specific adverse effect. Hazard identification (Choice C) is a risk assessment procedure in which an individual or an organization attempts to determine the effects that a substance may have on an individual. Risk characterization (Choice D) is a risk assessment procedure in which an individual or an organization attempts to determine the maximum amount of a substance that an individual may be exposed to on a daily basis before that individual will be likely to suffer an adverse effect.

Question No: 11

The Environmental Protection Agency (EPA) requires a Risk Management Plan (RMP) to include all of the following elements EXCEPT:

- A. An executive summary that provides information about the hazardous substances that the organization handles.
- B. The procedures and policies that the organization plans to use to prevent emergencies and improve safety.
- C. The worst-case scenarios for each of the different ways that the organization uses a hazardous substance.
- D. A summary of all risk management data that the organization has collected from risk assessments during the past five years.

Answer: D

Explanation: The Environmental Protection Agency (EPA) requires a Risk Management Plan (RMP) to include all of the following:

- an executive summary that provides information about the hazardous substances that the organization handles
- the procedures and policies that the organization plans to use to prevent emergencies and improve safety
- the actions that the organization plans to take if an emergency occurs
- the worst-case scenarios for each of the different ways that the organization uses a hazardous substance
- the emergency response plan that the organization has established to handle a worst-case scenario or another similar emergency
- a summary of the facility's accident history for the past five years
- proof that the facility is registered with the EPA including information about the exact location of the facility (mailing address, latitude and longitude, etc.)
- a statement indicating that the owner of the facility certifies that the information included in the Risk Management Plan is accurate

The EPA, however, does not require the RMP to include all of the data from the organization's risk assessments.

Question No: 12

A Risk Management Plan (RMP) analysis in which an organization attempts to create a series of procedures that a facility can use to respond to the release of a hazardous substance for a situation in which the hazardous substance does NOT spread as far as possible is known as

- A. an alternative release scenario analysis.
- B. an offsite consequence analysis.