1. Which of the following statements about a physical change is MOST accurate?

A. A physical change does not involve an exchange of energy.

B. A physical change is accompanied by some type of chemical change.

C. The substance undergoes chemical changes that affect size, shape, or appearance.

D. The substance remains chemically the same but changes in size, shape, or appearance.

2. Which of the following is MOST correct about what occurs in a chemical reaction?

A. A chemical reaction occurs very slowly.

B. A chemical reaction only involves one substance.

C. A substance changes in size, shape, or appearance.

D. A substance changes from one type of matter into another.

3. Which occurs with rapid oxidation?

A. Rust

B. Combustion

C. Smoldering

D. Vaporization

4. Reactions that give off thermal energy are called:

A. kinetic.

B. exothermic.

C. endothermic.

D. active reactions.

5. Converting water from a liquid to a gas requires:

A. a kinetic reaction.

B. an active reaction.

C. an exothermic reaction.

D. an endothermic reaction.

6. Which of the following is a characteristic of non-flaming combustion?

A. Occurs when oxygen content is lower

B. Occurs when oxygen content is higher

C. Occurs more slowly at a lower temperature

D. Occurs more slowly at a higher temperature

7. Which of the following is a characteristic of flaming combustion?

A. Smoldering glow on the material’s surface

B. Visible flames above the material’s surface

C. Single color smoke above the material’s surface

D. Puffs of black or gray smoke above the material’s surface

8. Which of the following would extinguish a fire under the simplest model of fire behavior?

A. Addition of oxygen

B. Removal of oxygen

C. Addition of solubles

D. Removal of pathways

9. Which element was added to the basic fire model to create the fire tetrahedron?

A. Fuel

B. Heat

C. Oxygen

D. Uninhibited chemical reaction

10. Which of the following is a chemical process that requires liquid or solid fuels to be vaporized or converted to the gas phase through the addition of heat?

A. Flaming combustion

B. Primary combustion

C. Nonflaming combustion

D. Secondary combustion

11. Which of the following is a measure of the average kinetic energy of the particles in a sample of matter?

A. Heat

B. Energy

C. Temperature

D. Compression

12. Energy possessed by a moving object is known as:

A. actual energy.

B. kinetic energy.

C. primary energy.

D. potential energy.

13. Which of the following refers to the rate at which work is performed or energy is converted from one form to another?

A. Work

B. Force

C. Power

D. Transmission

14. The energy that transfers from a high-temperature substance to a low-temperature substance is referred to as:

A. hot energy.

B. active energy

C. thermal energy.

D. potential energy.

15. Which type of ignition occurs when a mixture of fuel and oxygen encounter an external heat source with sufficient heat or thermal energy to start the combustion process?

A. Autoignition

B. Kinetic ignition

C. Piloted ignition

D. Primary ignition

16. Which of the following statements about the autoignition temperature of a substance is MOST accurate?

A. It is always lower than its piloted ignition temperature.

B. It is always higher than its piloted ignition temperature.

C. It is always the same as its piloted ignition temperature.

D. It may be either higher or lower than its piloted ignition temperature.

17. Which of the following refers to unintended resistance heating?

A. Arcing

B. Sparking

C. Smoldering

D. Overcurrent or overload

18. Which of the following refers to a high-temperature luminous electric discharge across a gap or through a medium such as charred insulation?

A. Arcing

B. Sparking

C. Smoldering

D. Overcurrent or overload

19. Which source of heat is generated by friction or compression?

A. Light energy

B. Chemical energy

C. Electrical energy

D. Mechanical energy

20. Insulating materials delay heat transfer primarily by:

A. slowing convection.

B. slowing conduction.

C. increasing conduction.

D. increasing convection.

21. Which type of heat transfer involves the transfer of thermal energy by the circulation or movement of a fluid (liquid or gas)?

A. Radiation

B. Convection

C. Conduction

D. Transmission

22. Which type of heat transfer involves the transmission of energy as electromagnetic waves without an intervening medium?

A. Radiation

B. Convection

C. Conduction

D. Penetration

23. Gypsum board is an example of a:

A. passive agent.

B. blocking agent.

C. nonreactive agent.

D. conductive agent.

24. Which of the following is known as the reducing agent in a combustion reaction?

A. Fuel

B. Heat

C. Oxygen

D. Inert gases

25. Which is an example of a hydrocarbon-based fuel?

A. Paper

B. Wood

C. Plastics

D. Gypsum board

26. Which of the following refers to the total amount of thermal energy released when a specific fuel amount is oxidized?

A. Heat release rate

B. Heat of reactivity

C. Heat of combustion

D. Realized heat energy

27. Which of the following refers to energy released per unit of time as a fuel burns?

A. Heat release rate

B. Heat of reactivity

C. Heat of combustion

D. Realized heat energy

28. Why are fuels such as methane, hydrogen, and acetylene considered some of the most dangerous of all fuel types?

A. They are odorless and colorless.

B. They are unstable under all circumstances.

C. There is no way to know their flammability ranges.

D. They are already in the physical state required for ignition.

29. Which of the following statements about vapor density is MOST accurate?

A. All gases are given a vapor density of 1.

B. Gases with a vapor density less than 1 will rise.

C. Gases with a vapor density greater than 1 will rise.

D. Gases may either rise or sink regardless of vapor density.

30. Water has a specific gravity of:

A. 0.

B. 1.

C. less than 1.

D. greater than 1.

31. Which of the following statements about liquids with a specific gravity of less than 1 is MOST accurate?

A. They will sink in water.

B. They will readily mix with water.

C. They may either float or sink in water.

D. They will float on the surface of water.

32. What is the minimum temperature at which a liquid gives off sufficient vapors to ignite but not sustain combustion?

A. Fire point

B. Flash point

C. Vapor point

D. Flame point

33. What is the temperature at which sufficient vapors are generated to sustain the combustion reaction?

A. Fire point

B. Flash point

C. Vapor point

D. Flame point

34. Which of the following is a characteristic of polar solvents?

A. They react with water.

B. They will sink in water.

C. They will not mix with water.

D. They will mix readily with water.

35. In solid fuels, what must occur to generate the flammable vapors required for combustion?

A. Pyrolysis

B. Flame over

C. Ventilation

D. Autoignition

36. Air contains approximately:

A. 14 percent oxygen.

B. 21 percent oxygen.

C. 33 percent oxygen.

D. 50 percent oxygen.

37. Which of the following statements about oxidizers is MOST accurate?

A. Oxidizers are combustible and highly volatile.

B. Oxidizers are neutral and do not affect combustion.

C. Oxidizers are combustible and also support or enhance combustion.

D. Oxidizers are not combustible but they will support or enhance combustion.

38. Materials that burn readily in oxygen-enriched atmospheres:

A. may not burn in normal oxygen levels.

B. generally flame out within several minutes.

C. tend to smolder and not create combustion.

D. will also always burn at normal oxygen levels.

39. What is the minimum concentration of fuel vapor and air that supports combustion?

A. Minimum flash point

B. Maximum flash point

C. Upper flammable limit

D. Lower flammable limit

40. What is the concentration fuel vapor and air above which combustion cannot take place?

A. Minimum flash point

B. Maximum flash point

C. Upper flammable limit

D. Lower flammable limit