Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Chem.G11-Q4-Exam

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Isomers have _____.
a. the same chemical and physical properties
b. the same chemical properties, but different physical properties
c. different chemical properties, but the same physical properties
d. different chemical and physical properties

____ 2. The term *cis* or *trans* in the name of a compound shows that the compound is a(n) _____.
a. alkane
b. alkyne
c. polymer
d. geometric isomer

____ 3. The six extra electrons in a benzene molecule are _____.
a. arranged in double bonds
b. arranged in alternate single and double bonds
c. shared equally by all six carbon atoms
d. shared equally by all six hydrogen atoms

____ 4. Fractional distillation of petroleum works because the components all have different _____.
a. boiling points
b. melting points
c. chemical properties
d. molecular structures

____ 5. An organic compound that contains a carbon atom bonded to a hydrogen atom and double-bonded to an oxygen atom is an _____.
a. alkene
b. alcohol
c. aldehyde
d. ether

____ 6. A process that typically yields alcohols is _____.
a. distillation
b. fermentation
c. polymerization
d. cracking

____ 7. Which pair of reactants listed below could take part in a condensation reaction?
a. methane and an alcohol
b. water and an alcohol
c. an alkane and an alcohol
d. an amine and a carboxylic acid

____ 8. The linking of amino acids by peptide bond formation is _____.
a. biochemistry
b. composition
c. organic chemistry
d. protein synthesis

____ 9. Which of the following elements is not essential in the makeup of body cells?
a. carbon
b. magnesium
c. nitrogen
d. oxygen

____ 10. One protein that transports substances through your body is _____.
a. collagen
b. an enzyme
c. hemoglobin
d. keratin

____ 11. Which of the following elements is not found in proteins?
a. hydrogen
b. nitrogen
c. sodium
d. sulfur

____ 12. When peptide bonds form, peptides and _____ are formed.
a. amino acids
b. carbon dioxide
c. oxygen
d. water

____ 13. _____ often results in the loss of biological activity of polypeptides.
a. Denaturation
b. Enzyme action
c. Peptide bonding
d. Substrating

____ 14. A carbohydrate that contains 24 hydrogen atoms contains _____ oxygen atoms.
a. 6
b. 12
c. 24
d. 48

____ 15. In animals, excess glucose is stored in the liver and muscles as _____.
a. cellulose
b. chitin
c. glycogen
d. starch

____ 16. Which of the following might be the number of oxygen atoms in a lipid that contains 30 hydrogen atoms?
a. 6
b. 15
c. 30
d. 60

____ 17. The wax applied to the paint of a car is an example of a _____.
a. carbohydrate
b. lipid
c. protein
d. steroid

____ 18. Which of the following is not true about cholesterol?
a. Excess cholesterol can form the plaque that can clog human arteries.
b. Controlling dietary cholesterol has no effect on blood cholesterol levels.
c. Exercise and stress affect cholesterol levels.
d. Your body does not need any cholesterol.

____ 19. Which of the following is not contained in a nucleic acid?
a. carbonate group
b. nitrogen-containing base
c. phosphate group
d. simple sugar

____ 20. A molecule contains sugar-phosphate chains and base pairs of cytosine-guanine and uracil-adenine. The molecule is _____.
a. an enzyme
b. DNA
c. RNA
d. a vitamin

____ 21. Which of the following vitamins is most likely to be removed from a food by boiling the food?
a. vitamin A
b. vitamin C
c. vitamin D
d. All will be removed.

____ 22. The total of all chemical reactions necessary for the life of an organism is _____.
a. digestion
b. glycolysis
c. metabolism
d. respiration

____ 23. The oxidation of fuel that releases energy needed by cells is _____.
a. digestion
b. glycolysis
c. metabolism
d. respiration

____ 24. Cells sometimes generate energy in the absence of oxygen in a process called _____.
a. digestion
b. fermentation
c. glycolysis
d. respiration

____ 25. The burning of gasoline in an automobile engine is an example of a(n) _____.
a. photosynthesis reaction
b. endothermic reaction
c. exothermic reaction
d. reversible reaction

____ 26. In a chemical change, energy can be _____.
a. created, but not destroyed
b. destroyed, but not created
c. either created or destroyed
d. neither created nor destroyed

____ 27. The two terms below that are identical in meaning are _____.
a. calorie and Calorie
b. calorie and joule
c. Calorie and joule
d. kilocalorie and Calorie

____ 28. The main source of energy for living things on Earth is _____.
a. combustion of fossil fuels
b. oxidation of dead organisms
c. solar energy
d. geothermal energy

____ 29. The major product formed during the process of photosynthesis is _____.
a. carbon dioxide
b. water
c. sugar
d. DNA

____ 30. In a(n) _____ reaction, the products are at a higher energy level than are the reactants.
a. activation
b. catalytic
c. endothermic
d. exothermic

____ 31. Even in an exothermic reaction, _____ is needed to get the reaction started.
a. activation energy
b. a catalyst
c. an endothermic reaction
d. an inhibitor

____ 32. The energy involved in endothermic and exothermic reactions is _____.
a. chemical
b. heat
c. light
d. electrical

____ 33. If the heat of reaction is negative, the reaction is _____.
a. endothermic
b. exothermic
c. negative
d. positive

____ 34. If the energy graphs of a reaction, catalyzed and uncatalyzed, are examined, the peak representing activation energy is _____ for the catalyzed reaction.
a. equal
b. higher
c. lower
d. unchanged

____ 35. When bowling pins at the end of an alley are hit by a bowling ball, the entropy of the pins _____.
a. decreases
b. increases
c. is spontaneous
d. stays the same

____ 36. If a reaction results in increased energy and increased entropy, will the reaction be spontaneous?
a. no
b. yes
c. yes, if the temperature is high
d. yes, if the temperature is low

____ 37. A _____ is the heat required to raise the temperature of 1 g of liquid water by 1ºC.
a. calorie
b. Calorie
c. kilocalorie
d. joule

____ 38. If 16 cans are produced from aluminum made from ore, how many cans can be made from recycled aluminum for the same cost?
a. 8
b. 16
c. 32
d. 48

____ 39. In processes that produce electricity, some of the energy used is wasted as _____ energy.
a. chemical
b. heat
c. kinetic
d. light

____ 40. The process that uses carbon dioxide and water, in the presence of sunlight and chlorophyll, to form simple sugar and oxygen is _____.
a. capillary action
b. digestion
c. photosynthesis
d. respiration

____ 41. The ultimate source of energy in the food web is _____.
a. the sun
b. photosynthesis
c. light reactions
d. the Calvin cycle

____ 42. When photosynthesis is compared to the burning of fossil fuels, photosynthesis is a(n) _____ efficient process.
a. less
b. more
c. equally

____ 43. Why is the natural process of photosynthesis far more efficient than electricity production by industrial processes?
a. Industrial processes that produce electricity increase entropy through the combustion of carbon dioxide and water.
b. Industrial processes that produce electricity convert energy from one form to another yet maintain low-entropy systems.
c. Photosynthesis builds complex high-energy molecules in a process in which entropy decreases.
d. Photosynthesis releases waste heat and increases the entropy of the environment.

____ 44. How can industrial processes be as efficient as photosynthesis?
a. decrease entropy by an increase of waste heat
b. decrease entropy by a decrease of waste heat
c. increase entropy by an increase of waste heat
d. increase entropy by a decrease of waste heat

____ 45. Materials that continue to glow in the dark after they have been exposed to light are said to be _____.
a. radioactive
b. unstable
c. phosphorescent
d. incandescent

____ 46. In a reactor, nuclear energy is produced in the _____.
a. moderator
b. coolant
c. fuel rods
d. turbine

____ 47. Compared to an electron, a positron has _____.
a. the same mass and charge
b. different mass and charge
c. the same charge, but a different mass
d. the same mass, but a different charge

____ 48. Who of the following was not important in the discovery of radiation?
a. Neils Bohr
b. Marie Curie
c. Pierre Curie
d. Henri Becquerel

____ 49. A(n) _____ is a high energy electron.
a. beta particle
b. helium nucleus
c. alpha particle
d. positron

____ 50. Which type of radiation is most penetrating?
a. alpha
b. beta
c. gamma
d. They are equal.

____ 51. Which is the only type of radiation that might penetrate the walls of a house?
a. alpha
b. beta
c. gamma
d. All will penetrate.

____ 52. What is the source of the electrons produced in beta decay?
a. an outer energy level
b. a valence electron
c. a neutron
d. a proton

____ 53. The radiation detector that uses detection of flashes of light is a _____.
a. bubble chamber
b. film badge
c. Geiger counter
d. scintillation counter

____ 54. How much hydrogen-3 will remain after 60 years if the original sample had a mass of 80.0 g and the half-life of hydrogen-3 is 12 years?
a. 1.25 g
b. 2.50 g
c. 5.00 g
d. 10.0 g

____ 55. Which of the following isotopes is not commonly used for dating objects?
a. carbon-14
b. phosphorus-32
c. potassium-40
d. rubidium-87

____ 56. Which of the following could be dated using carbon-14?
a. ashes from a fire
b. a rock
c. glacial deposits
d. lava fields

____ 57. When one large nucleus is split into two smaller nuclei, the process is nuclear _____.
a. decay
b. fission
c. fusion
d. tracing

____ 58. Which produces more energy--nuclear fission or nuclear fusion?
a. fission
b. fusion
c. They produce the same amount.
d. It depends on the reaction.

____ 59. The greatest source of radiation most humans are exposed to is _____.
a. cosmic rays
b. medical X rays
c. radon
d. rocks and soil

____ 60. Most radioactive waste is generated in _____.
a. hospitals
b. nuclear reactors
c. tokamaks
d. uranium mines

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