

Chapter 02 The Nature of Life?

Multiple Choice Questions

1. Which of the following is NOT a form of metabolism?
 - A. respiration
 - B. photosynthesis
 - C. diffusion**
 - D. digestion
 - E. assimilation

2. Which of the following metabolic activities of plants produces sugars?
 - A. photosynthesis**
 - B. assimilation
 - C. digestion
 - D. respiration
 - E. None of these answers are correct.

3. Determination of whether something is a living organism or a nonliving object is based on _____.
 - A. a single characteristic such as change in position
 - B. presence of carbon and hydrogen atoms
 - C. several characteristics such as DNA and other organic materials inside a cell**
 - D. movement
 - E. presence of carbon and oxygen atoms

4. As living individuals grow and reproduce their response to environmental stimuli may include _____.
 - A. movement
 - B. increase in size
 - C. change in position
 - D. all of these**
 - E. none of these

5. Which of the following is NOT an attribute of all living organisms?

- A. response to stimuli
- B. metabolism
- C.** nervous system
- D. reproduction
- E. growth

6. Which of the following is NOT an attribute of all living organisms?

- A. metabolism
- B.** photosynthesis
- C. reproduction
- D. response to stimuli
- E. adaptation to the environment

7. Reproduction in living organisms results in _____.

- A.** new individuals of the same species
- B. new individuals that are always genetically identical to the parents
- C. new individuals that are never genetically identical to the parents
- D. overpopulation of the community by that species
- E. loss of genetic variability in the population

8. Response to a stimulus _____.

- A. requires movement
- B.** may include a cell-level, or chemical change in the individual
- C. may occur without any chemical or physical change by the individual
- D. is not characteristic of rooted plants.
- E. always changes the genetic information

9. The basic 'stuff of the universe' or matter has which of the following characteristics?

- A. occupies space
- B. has mass
- C. is composed of atomic elements
- D. a and b only
- E.** all of the above

10. At present the number of elements naturally occurring on earth is _____.

- A. less than 90
- B. 93**
- C. 98
- D. 104
- E. more than 105

11. The number of protons and electrons in a neutral atom is

- A. quite variable.
- B. the same.**
- C. unknown.
- D. always unequal.
- E. unrelated.

Stern - 002 Chapter... #3

12. The atomic number of an element is based on

- A. the number of electrons associated with a single atom.
- B. the number of neutrons in the nucleus of an atom.
- C. the number of isotopes associated with it.
- D. the number of protons present in a single atom.**
- E. its atomic mass.

Stern - 002 Chapter... #15

13. The volume of space in which a given electron occurs 90% of the time is called

- A. an orbital.**
- B. a nucleus.
- C. an atom.
- D. a molecule.
- E. a bond.

Stern - 002 Chapter... #16

14. The element with the lowest atomic number and/or mass is

- A. oxygen.
- B.** hydrogen.
- C. boron.
- D. nitrogen.
- E. carbon.

Stern - 002 Chapter... #17

15. Electrons are essentially

- A. positive electric charges.
- B.** negative electric charges.
- C. unstable isotopes.
- D. uncharged particles.
- E. atomic particles that are bonded together.

Stern - 002 Chapter... #18

16. Which of the following carries a single positive charge?

- A.** proton
- B. neutron
- C. lepton
- D. electron
- E. quark

Stern - 002 Chapter... #27

17. The mass of the protons and neutrons added is the

- A. atomic sum.
- B. atomic number.
- C.** atomic weight.
- D. atomic charge.
- E. atomic coefficient.

Stern - 002 Chapter... #28

18. What is the maximum number of electrons that can occupy the innermost electron orbital?

- A.** 2
- B. 4
- C. 6
- D. 8
- E. 10

Stern - 002 Chapter... #29

19. Unfilled positions within an electron orbital tend to make the atom

- A. unreactive.
- B. neutral.
- C. less reactive.
- D.** more reactive.
- E. stable.

Stern - 002 Chapter... #30

20. A substance consisting of two or more elements united in a definite ratio by chemical bonds is called a

- A. molecule.
- B. mixture.
- C.** compound.
- D. base.
- E. valence.

Stern - 002 Chapter... #4

21. The bonds that hold atoms together do so through the sharing or transfer of

- A. atomic nuclei.
- B.** electrons.
- C. protons.
- D. neutrons.
- E. molecules.

Stern - 002 Chapter... #10

22. Which type of chemical bond involves the transfer of electrons?

- A.** ionic
- B. covalent
- C. hydrogen
- D. both [ionic and covalent] are correct
- E. both [ionic and hydrogen] are correct

Stern - 002 Chapter... #31

23. Which element is capable of forming triple covalent bonds?

- A. carbon
- B. hydrogen
- C. oxygen
- D.** nitrogen
- E. potassium

Stern - 002 Chapter... #32

24. Carbon has an atomic number of 6. How many electrons does carbon have in its first and second electron orbitals, respectively?

- A.** 2, 4
- B. 4, 2
- C. 1, 5
- D. 3, 3
- E. 0, 6

Stern - 002 Chapter... #33

25. If there is an asymmetric charge distribution on a molecule creating a positively charged sector and a negatively charged sector, the type of molecule resulting would be _____.

- A. neutral.
- B. charged.
- C.** polar.
- D. hydrophobic.
- E. radioactive.

26. A solution that is slightly alkaline would have a pH in the range of
- A. 8.5.
 - B. 7.5.**
 - C. 7.0.
 - D. 6.5.
 - E. 2.0.

Stern - 002 Chapter... #2

27. An acid is a compound that
- A. releases hydroxyl ions when dissolved in water.
 - B. forms water when mixed with a salt.
 - C. releases positively charged hydrogen ions when dissolved in water.**
 - D. converts starch to glucose.
 - E. converts proteins to carbohydrates.

Stern - 002 Chapter... #6

28. When an acid and a base are mixed together, which of the following is produced?
- A. a salt**
 - B. a mixture
 - C. an isotope
 - D. a lipid
 - E. a carbohydrate
29. Which of the following pH values is considered neutral (i.e., neither acidic nor basic)?
- A. 6.8
 - B. 7.3
 - C. 7.5
 - D. 8.0
 - E. none of the choices are correct**

30. Laws pertaining to energy are called laws of _____.

- A. metabolism
- B. aerodynamics
- C. atomic fusion
- D.** thermodynamics
- E. heredity

31. Covalent bonds between molecules inside living cells are often formed or broken through the addition or loss of _____.

- A. carbon dioxide
- B. oxygen
- C.** water
- D. chlorine and sodium
- E. neutrons

32. Classes of proteins called _____ function as organic catalysts for chemical reactions in cells.

- A. peptides
- B.** enzymes
- C. thermal agents
- D. disaccharides
- E. hormones

33. _____ polymers serve as the genetic memory in living cells.

- A. Carbohydrate
- B.** Nucleic acids
- C. Proteins
- D. Lipids
- E. Two or more of these

34. Structural and functional molecules making up a cell have a skeleton of _____.

- A.** carbon, hydrogen and oxygen
- B. nitrogen and oxygen
- C. silicon and oxygen
- D. carbon and oxygen
- E. calcium phosphate

35. Which of the following is NOT a major component of protoplasm?

- A. carbon
- B. hydrogen
- C. oxygen
- D. nitrogen
- E.** sulfur

36. Sugar and starch molecules contain which of the following elements?

- A. carbon
- B. hydrogen
- C. nitrogen
- D. phosphorus
- E.** both [carbon and hydrogen]

Stern - 002 Chapter... #5

37. The basic units or subunits of which a protein is composed are _____.

- A. fatty acids
- B. glycerols
- C. monosaccharides
- D.** amino acids
- E. nucleic acids

38. Compounds that consist of carbon, hydrogen, and oxygen in a ratio of CH_2O are _____.

- A. lipids
- B. proteins
- C. nucleic acids
- D. enzymes
- E. carbohydrates**

39. Each nucleotide of a DNA molecule consists of a nitrogenous base plus _____.

- A. a 5-carbon sugar and a phosphate group**
- B. an RNA molecule
- C. a sulfur salt
- D. a form of starch and a potassium ion
- E. a lipid and a carbohydrate

40. The number of naturally occurring amino acids is _____.

- A. 20**
- B. 600
- C. less than 10
- D. 35
- E. 64

41. What type of chemical bond joins amino acids together?

- A. hydrogen
- B. glycosidic
- C. ionic
- D. peptide**
- E. both [glycosidic and peptide] are correct

42. The linear sequence of amino acids in a polypeptide chain is called the _____.

- A. primary structure
- B. secondary structure
- C. tertiary structure
- D. quaternary structure
- E. beta structure

43. A disulfide linkage or bond would be instrumental in maintaining the _____ structure of a protein.

- A. primary
- B. secondary
- C. tertiary
- D. quaternary
- E. alpha

44. A fatty acid which has all possible hydrogen atoms bonding to each carbon atom would be _____.

- A. saturated
- B. unsaturated
- C. polycarbonated
- D. polyoxygenated
- E. polyunsaturated

True / False Questions

45. Callose is produced on the bark of a plant that has been damaged.

FALSE

46. An isotope has neutrons differing in number from that of a typical element.

TRUE

47. A base is a compound that releases hydrogen ions when dissolved in water.

FALSE

48. Hydrolysis of starch involves the addition of water molecules to the starch molecule.

TRUE

49. If a lipid has its fatty acids attached to a glycerol molecule, it is called a wax.

FALSE

50. An ion is neither positively nor negatively charged.

FALSE

51. Protein molecules differ from those of carbohydrates and lipids in having nitrogen present.

TRUE

52. Pyrimidines and purines are two types of amino acids.

FALSE

53. Peptide bonds link the building blocks of carbohydrates together.

FALSE

54. Nucleotides and amino acids are both “building blocks” of larger molecules.

TRUE

Stern - 002 Chapter... #49

55. Assimilation is the conversion of raw materials into protoplasm and other cell substances.

TRUE

Stern - 002 Chapter... #50

56. Potential energy can be converted to kinetic energy.

TRUE

Stern - 002 Chapter... #51

57. The combining capacity of an atom or ion is referred to as its *valence*.

TRUE

Stern - 002 Chapter... #52

58. If hydrogen atoms are attached to every available attachment point of fatty acid carbon atoms in a fat, the fat is said to be unsaturated.

FALSE

Stern - 002 Chapter... #53

59. All hormones and enzymes are lipids.

FALSE

Stern - 002 Chapter... #54

60. Most proteins are synthesized in the nucleus.

FALSE

Stern - 002 Chapter... #55

61. The nucleotides of DNA molecules are linked in ladderlike fashion between the two strands.

TRUE

Stern - 002 Chapter... #56