1. Which process produces peptide bonds?
   (1) digestion  (2) hydrolysis  (3) dehydration synthesis  (4) enzyme deactivation

2. Which pair of compounds can be classified as organic?
   (1) nucleic acids and minerals (2) proteins and water
   (3) water and salts  (4) nucleic acids and proteins

3. Which chemical formula represents a carbohydrate molecule?
   (1) \( C_6H_6O_6 \) (2) \( C_{12}H_{12}O_6 \)
   (3) \( C_6H_{12}O_5 \) (4) \( C_6H_{12}O_6 \)

4. Glucose and maltose are both classified as organic compounds because they both are
   (1) carbon-containing substances
   (2) composed of simple elements
   (3) waste products
   (4) artificial sugars

5. On the pH scale a solution which is neutral would
   (1) have a low pH  (2) have a high pH
   (3) have a pH of 7  (4) contain no ions

6. Atomic particles that are negatively charged are called
   (1) protons (2) neutrons
   (3) electrons (4) positrons

7. What are the fundamental building blocks of proteins?
   (1) fatty acids (2) carboxyl groups
   (3) amino acids (4) glucose rings

8. Which element is present in both starch and protein?
   (1) iron (2) nitrogen
   (3) calcium (4) carbon
9. A nucleotide would most likely contain the element
(1) sulfur          (2) carbon
(3) nitrogen        (4) phosphorus

10. The particles of NaCl exist as
(1) related isotopes       (2) positive and negative ions
(3) separate molecules     (4) covalent bonds

11. Which organic compound is correctly matched with the subunit that composes it?
(1) maltose - amino acid   (2) starch - glucose
(3) protein - fatty acid   (4) lipid - sucrose

12. A sample of small, soluble, organic molecules was analyzed and found to contain the elements carbon, oxygen, hydrogen and nitrogen. It is most likely that the molecules were
(1) lipids                     (2) fatty acids
(3) simple sugars              (4) amino acids

13. Compared to carbohydrates, the ratio of hydrogen to oxygen in lipids is
(1) the same                   (2) sometimes smaller
(3) always smaller             (4) always greater

14. A compound whose chemical composition is most closely related to maltose is
(1) starch                     (2) ATP
(3) protein                    (4) RNA

15. A molecular group consisting of a sugar molecule, a phosphate group, and a nitrogen base is a
(1) nucleoprotein              (2) nucleic acid
(3) nucleotide                 (4) nucleolus

16. Most of the enzymes involved in aerobic cellular respiration are located in the organelle known as the
(1) vacuole                    (2) mitochondrion
(3) Golgi body                 (4) nucleus

17. All of the following are parts of the cell theory except
(1) All cells must come from preexisting cells.
(2) Cells are the basic unit of structure in living things.
(3) Cells are the basic unit of function in living things.
(4) Mitochondria and chloroplasts are self-replicating.
18. The endoplasmic reticulum is normally associated with which function?
(1) intracellular transport (2) formation of ATP
(3) reproduction (4) digestion

19. In which organelle would water and dissolved minerals be stored?
(1) vacuole (2) mitochondrion
(3) Golgi body (4) nucleus

4. Most cellular respiration in plants takes place in organelles known as
(1) chloroplasts (2) stomates
(3) ribosomes (4) mitochondria

21. Active transport of certain proteins from the environment of a cell into the cell is most closely associated with the
(1) cell membrane (2) cell wall
(3) ribosome (4) nucleolus

22. Which cell organelles are considered the sites of aerobic respiration in both plant and animal cells?
(1) mitochondria (2) centrosomes
(3) chloroplasts (4) nuclei

23. Which statement about ribosomes is true?
(1) They are the sites of protein synthesis.
(2) They function in cell division.
(3) They contain DNA.
(4) They permit cells to contract.

3. Cell membranes consist chiefly of
(1) carbohydrates and lipids (2) carbohydrates and nucleic acids
(3) proteins and lipids (4) proteins and carbohydrates

25. Osmosis is a physical process most closely associated with
(1) absorption (2) irritability
(3) locomotion (4) reproduction

4. One of the major processes involved in the transport of molecules within cells is
(1) osmosis (2) hydrolysis
(3) pinocytosis (4) cyclosis

27. A structure associated with synthesis of components of ribosomes is the
(1) mitochondrion (2) nucleolus
(3) Golgi body (4) endoplasmic reticulum
28. ATP molecules are most closely associated with the process of
   (1) diffusion    (2) active transport
   (3) respiratory gas exchange (4) osmosis

29. In a plant cell, which process serves a function similar to that of the
circulatory system in humans?
   (1) photosynthesis    (2) osmosis
   (3) respiration       (4) cytoplasmic streaming

31. Xylem is a plant tissue which
   (1) conducts water upward  (2) transports organic food materials
   (3) absorbs minerals from soil (4) regulates the size of stomates

32. The veins of leaves are actually
   (1) non-living supports  (2) the main sites of photosynthesis
   (3) conducting tissues  (4) spaces for the exchange of gases

33. In a plant, an example of a meristematic tissue is
   (1) parenchyma          (2) epithelium
   (3) schlerenchyma       (4) cambium

34. Of the following plant tissues, the most specialized is
   (1) cambium            (2) phloem
   (3) apical meristem    (4) root-tip meristem

35. In humans, the elastic, flexible connective tissue that is found
between the vertebrae is known as
   (1) chitin              (2) cartilage
   (3) bone               (4) tendons

36. Skin is an example of
   (1) muscle             (2) nerve
   (3) epithelial tissue  (4) connective tissue

37. Skin color in humans depends on the melanocyte. Which type of tissue
contains melanocytes?
   (1) simple squamous epithelium
   (2) simple columnar epithelium
   (3) stratified squamous epithelium
   (4) stratified columnar epithelium
38. Melanocytes are generally found in
(1) people descended from Africa, only
(2) people descended from Africa and in Native Americans
(3) people of Eastern Hemispheric origin, only
(4) all people regardless of origin

39. Body fat is a result of the deposition of tissue known as
(1) adipose  (2) cartilage
(3) epithelium:  (4) dense connective

40. The heart is primarily composed of
(1) nerve  (2) epithelium
(3) muscle  (4) bone

41. The raw materials for photosynthesis are
(1) water and oxygen  (2) carbon dioxide and oxygen
(3) sunlight and chlorophyll  (4) carbon dioxide and water

42. Which color of light is best for photosynthesis?
(1) red  (2) green
(3) orange  (4) yellow

43. The carbon atoms that are included within a molecule of sugar originally came from
(1) chlorophyll  (2) carbon dioxide
(3) oxygen  (4) water

44. In photosynthesis, carbon dioxide is required by the
(1) photochemical reactions, only
(2) carbon-fixation reactions, only
(3) both the photochemical and carbon-fixation reactions
(4) neither the photochemical nor carbon-fixation reactions

45. Chlorophyll is important in photosynthesis because chlorophyll
(1) reflects green light energy
(2) reflects red light energy
(3) converts light energy into electrical energy
(4) converts chemical bond energy of glucose into ATP
Base your answers to questions 46 through 47 on the diagram below.

\[
\text{enzymes} \quad +O_2 \quad \text{enzymes} \\
\text{glucose} \rightarrow 2 \text{ pyruvates} \rightarrow \text{CO}_2 + \text{H}_2\text{O}
\]

46. The total process shown as Phases A and B is important because it
(1) converts light energy into chemical energy
(2) converts light energy into heat energy
(3) converts chemical bond energy into a form usable by cells
(4) requires no energy to initiate the process

47. The reactions of Phase B occur in the
(1) chloroplast (2) nucleus
(3) mitochondrion (4) endoplasmic reticulum

48. Lactic acid is produced in organisms as a result of
(1) aerobic respiration (2) anaerobic respiration
(3) dehydration synthesis (4) photosynthesis

49. Fermentation products of yeast cells include
(1) water and minerals (2) alcohol and carbon dioxide
(3) water and alcohol (4) carbon dioxide and minerals

50. Green plants produce O\textsubscript{2} as a result of the process of
(1) aerobic respiration (2) transpiration
(3) photosynthesis (4) carbon fixation