

BIOL-8 Practice Test 01

Modules 1-6: Foundations of Human Biology

Instructions: This practice test covers material from Modules 1-6. Answer all questions to the best of your ability.

Part A: Multiple Choice (36 questions)

Choose the best answer for each question.

Module 1: Exploring Life Science

1. Which of the following is a characteristic of ALL living things?

- A) The ability to move
- B) The ability to photosynthesize
- C) Cellular organization
- D) Sexual reproduction

2. What is the correct order of the levels of biological organization, from smallest to largest?

- A) Cell → Tissue → Organ → Organ System → Organism
- B) Tissue → Cell → Organ → Organism → Organ System
- C) Organ → Tissue → Cell → Organ System → Organism
- D) Organism → Organ System → Organ → Tissue → Cell

3. In a controlled experiment, what is the factor that the scientist deliberately changes?

- A) Dependent variable
- B) Independent variable
- C) Control group
- D) Constant

4. What is the difference between a hypothesis and a theory?

- A) Hypotheses are tested; theories are untested guesses
- B) Theories are well-supported by many experiments
- C) They mean the same thing
- D) Hypotheses are always correct

5. Homeostasis refers to:

- A) The process of cell division
- B) Maintaining a stable internal environment
- C) The study of body structure
- D) Energy production in cells

6. Organisms that make their own food are called:

- A) Heterotrophs
 - B) Autotrophs
 - C) Consumers
 - D) Decomposers
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Module 2: Chemistry of Life

7. What subatomic particle determines the atomic number of an element?

- A) Electron
- B) Neutron
- C) Proton
- D) Ion

8. When atoms SHARE electrons, they form a:

- A) Ionic bond
- B) Covalent bond
- C) Hydrogen bond
- D) Metallic bond

9. Water is considered a polar molecule because:

- A) It dissolves salt
- B) It has a high boiling point
- C) Electrons are shared unequally between atoms
- D) It contains hydrogen

10. Which of the following is true about acids?

- A) They have a pH greater than 7
- B) They have a pH less than 7
- C) They have a pH equal to 7
- D) They cannot be measured by pH

11. The four elements most common in living things are:

- A) C, H, O, N
- B) Fe, Ca, K, Na
- C) He, Ne, Ar, Xe
- D) Au, Ag, Cu, Zn

12. Hydrogen bonds are important in water because they:

- A) Make water a solid at room temperature
- B) Give water its unique properties like high specific heat
- C) Prevent water from dissolving substances
- D) Make water nonpolar

13. A substance that releases hydrogen ions (H^+) in solution is called:

- A) A base
 - B) An acid
 - C) A buffer
 - D) A salt
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Module 3: Biomolecules

14. What type of reaction builds polymers by removing water?

- A) Hydrolysis
- B) Dehydration synthesis
- C) Oxidation
- D) Reduction

15. Which macromolecule is the body's primary source of quick energy?

- A) Protein
- B) Lipid
- C) Carbohydrate
- D) Nucleic acid

16. The building blocks (monomers) of proteins are:

- A) Monosaccharides
- B) Amino acids
- C) Nucleotides
- D) Fatty acids

17. What determines the unique shape and function of a protein?

- A) Its color
- B) The sequence of amino acids
- C) The number of carbon atoms
- D) Its location in the cell

18. DNA and RNA are examples of:

- A) Carbohydrates
- B) Lipids
- C) Proteins
- D) Nucleic acids

19. The process of breaking polymers apart by adding water is called:

- A) Dehydration synthesis
 - B) Hydrolysis
 - C) Condensation
 - D) Polymerization
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Module 4: Cellular Function

20. According to cell theory, all cells:

- A) Contain chloroplasts
- B) Come from pre-existing cells
- C) Are the same size
- D) Have a nucleus

21. The main difference between prokaryotic and eukaryotic cells is:

- A) Prokaryotes are larger
- B) Eukaryotes lack ribosomes
- C) Prokaryotes lack a membrane-bound nucleus
- D) Eukaryotes cannot reproduce

22. Which organelle produces ATP through cellular respiration?

- A) Nucleus
- B) Ribosome
- C) Mitochondria
- D) Golgi apparatus

23. Where are proteins made in the cell?

- A) Nucleus
- B) Mitochondria
- C) Ribosomes
- D) Lysosomes

24. Which structure is found in plant cells but NOT in animal cells?

- A) Mitochondria
- B) Ribosomes
- C) Cell wall
- D) Plasma membrane

25. The organelle that modifies, packages, and ships proteins is the:

- A) Nucleus
 - B) Ribosome
 - C) Mitochondria
 - D) Golgi apparatus
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Module 5: Membranes

26. The fluid mosaic model describes:

- A) How DNA replicates
- B) The structure of cell membranes
- C) Protein synthesis
- D) Cell division

27. Which type of transport does NOT require energy from the cell?

- A) Active transport
- B) Endocytosis
- C) Passive transport
- D) Exocytosis

28. A red blood cell placed in pure water will:

- A) Shrink
- B) Swell and possibly burst
- C) Remain unchanged
- D) Divide

29. Osmosis is specifically the movement of:

- A) Solutes from high to low concentration
- B) Water across a semipermeable membrane
- C) Proteins across the membrane
- D) Ions using ATP

30. What type of transport uses carrier proteins but no ATP?

- A) Simple diffusion
- B) Facilitated diffusion
- C) Active transport
- D) Endocytosis

31. The sodium-potassium pump moves:

- A) Both ions in the same direction
- B) Sodium out and potassium into the cell
- C) Water molecules
- D) Without using ATP

32. A cell placed in a hypertonic solution will:

- A) Swell
 - B) Shrink
 - C) Stay the same
 - D) Divide
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Module 6: Metabolism

33. ATP is best described as:

- A) A protein
- B) The energy currency of cells
- C) A type of lipid
- D) Genetic material

34. Enzymes work by:

- A) Increasing activation energy
- B) Lowering activation energy
- C) Providing energy for reactions
- D) Changing the products of a reaction

35. Glycolysis occurs in the:

- A) Nucleus
- B) Mitochondria
- C) Cytoplasm
- D) Chloroplast

36. When oxygen is NOT available, cells may carry out:

- A) Aerobic respiration
 - B) Photosynthesis
 - C) Fermentation
 - D) The citric acid cycle
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Part B: Fill in the Blank (12 questions)

Write the correct term in the blank.

37. The basic unit of life is the _____.

38. The _____ is the organelle that contains the cell's genetic material.

39. Atoms of the same element with different numbers of neutrons are called _____.

40. A solution with a pH greater than 7 is _____.

41. The monomer (building block) of carbohydrates is the _____.

42. Lipids are used for long-term _____ storage.

- 43.** The _____ is the site of protein synthesis in all cells.
- 44.** The cell membrane is made primarily of a double layer of _____.
- 45.** The movement of water from high to low concentration across a membrane is called _____.
- 46.** An _____ solution has a higher solute concentration than inside the cell.
- 47.** The energy molecule used by all cells is _____ (abbreviation is fine).
- 48.** Enzymes are made of _____ (type of macromolecule).
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Part C: Short Answer (6 questions)

Answer each question in 2-3 complete sentences.

- 49.** List three characteristics that all living things share.

- 50.** Compare ionic bonds and covalent bonds. How are they different?

- 51.** Name the four major types of biomolecules and identify which one stores genetic information.

- 52.** Describe two differences between prokaryotic and eukaryotic cells.
- 53.** Explain why the cell membrane is described as "selectively permeable." Give an example of passive and active transport.
- 54.** Compare the ATP yield of aerobic respiration and fermentation. Why is fermentation less efficient?

End of Practice Test 01