

# 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.

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### 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?

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*End of Practice Test 01*