BIOL-8 Practice Test 01

Modules 1-4: Foundations of Human Biology

Instructions: This practice test covers material from Modules 1-4. Answer all questions to the best of your ability. This test is designed to help you prepare for the first exam.

Part A: Multiple Choice (32 questions)

Choose the best answer for each question.

Module 1: Exploring Life Science

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

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

2. What is the correct order 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) Cell → Organ → Tissue → Organ System → Organism

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

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

4. What distinguishes a scientific theory from a hypothesis?

A) Hypotheses are tested; theories are untested guesses B) A theory is supported by a large body of evidence from many experiments C) They mean the same thing in science D) Hypotheses are always proven correct before becoming theories

5. Homeostasis refers to:

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

6. A patient has a fever of 103°F. The body responds by sweating to cool down. This is an example of:

A) Positive feedback B) Negative feedback C) Homeostatic failure D) Metabolism

7. Anatomy is the study of body **__, while physiology is the study of body _____.**

A) function; structure B) structure; function C) cells; tissues D) organs; organ systems

8. Which level of biological organization is correctly matched with its example?

A) Tissue — a single white blood cell B) Organ — the stomach C) Cell — the cardiovascular system D) Organism — the biceps muscle

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Module 2: Chemistry of Life

9. The atomic number of an element is determined by its number of:

A) Electrons B) Neutrons C) Protons D) Protons + Neutrons

10. When atoms SHARE electrons, they form a:

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

11. Water is considered a polar molecule because:

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

12. A solution with a pH of 3 would be classified as:

A) Strongly basic B) Neutral C) Strongly acidic D) A buffer

13. The four elements that make up approximately 96% of living matter are:

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

14. Hydrogen bonds between water molecules are responsible for which property?

A) Making water a solid at room temperature B) Giving water a high specific heat capacity C) Preventing water from dissolving ionic compounds D) Making water nonpolar

15. Buffers are important in the human body because they:

A) Increase pH to very high levels B) Resist changes in pH when acids or bases are added C) Eliminate all acids from the blood D) Convert water into hydrogen ions

16. Atoms of the same element that have different numbers of neutrons are called:

A) Ions B) Isotopes C) Isomers D) Molecules

Module 3: Biomolecules

17. The type of reaction that builds polymers by removing water is called:

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

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

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

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

A) Monosaccharides B) Amino acids C) Nucleotides D) Fatty acids and glycerol

20. What primarily determines the unique three-dimensional shape and function of a protein?

A) The temperature of the cell B) The sequence of amino acids C) The total number of carbon atoms D) The protein's location in the body

21. DNA and RNA are classified as:

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

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

A) Dehydration synthesis B) Hydrolysis C) Condensation D) Polymerization

23. Saturated fatty acids differ from unsaturated fatty acids because saturated fats:

A) Contain double bonds between carbon atoms B) Have no double bonds and are typically solid at room temperature C) Are found only in plants D) Are always liquid at room temperature

24. When a protein is exposed to extreme heat or pH, it unfolds and loses its function. This is called:

A) Hydrolysis B) Denaturation C) Dehydration synthesis D) Polymerization

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Module 4: Cellular Function

25. According to cell theory, which of the following is true?

A) All cells contain chloroplasts B) All cells come from pre-existing cells C) All cells are the same size D) All cells have a membrane-bound nucleus

26. The main difference between prokaryotic and eukaryotic cells is that:

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

27. Which organelle is the primary site of ATP production through cellular respiration?

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

28. Ribosomes are the site of:

A) ATP production B) Protein synthesis C) Lipid digestion D) DNA replication

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

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

30. The Golgi apparatus functions to:

A) Produce ATP B) Store DNA C) Modify, package, and ship proteins D) Break down worn-out organelles

31. The rough endoplasmic reticulum appears "rough" because it is studded with:

A) Mitochondria B) Lysosomes C) Ribosomes D) Golgi vesicles

32. The endosymbiotic theory proposes that mitochondria and chloroplasts:

A) Were created by the nucleus B) Were once free-living prokaryotes engulfed by a host cell C) Evolved from the Golgi apparatus D) Are found only in prokaryotic cells

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Part B: Fill in the Blank (10 questions)

Write the correct term in the blank.

33. The basic unit of life is the _____.

34. The ability of an organism to maintain a stable internal environment is called _____.

35. In an experiment, the group that does NOT receive the treatment is the _____ group.

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

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

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

39. Lipids that make up the core of cell membranes are called _____.

40. Enzymes, antibodies, and hemoglobin are all examples of _____ (macromolecule type).

41. The _____ is the organelle that contains the cell's DNA and controls its activities.

42. The _____ is the organelle that digests worn-out cell parts and foreign material.

Part C: Short Answer (5 questions)

Answer each question in 2-4 complete sentences.

43. List four characteristics shared by all living things and briefly explain each.

44. Compare ionic bonds and covalent bonds. How does each type form? Give one example of a molecule held together by each.

45. Name the four major types of biomolecules, identify the monomer for each, and state a primary function.

46. Describe three differences between prokaryotic and eukaryotic cells.

47. Trace the path of a protein from its production to its export from the cell. Include the organelles involved at each step.

End of Practice Test 01