

Foundational Concepts in Advanced Biology

Biology · Answer Key · 15 Questions

1. What is the primary function of mitochondria within a eukaryotic cell?

- A) Protein synthesis
- B) Energy production (ATP generation)**
- C) Waste removal
- D) Genetic material storage

2. Which molecule carries the genetic instructions for the development, functioning, growth, and reproduction of all known organisms?

- A) RNA
- B) Protein
- C) DNA**
- D) Lipid

3. Photosynthesis is the process by which plants convert light energy into chemical energy. What gas is consumed during photosynthesis?

- A) Oxygen
- B) Nitrogen
- C) Carbon Dioxide**
- D) Methane

4. The theory of evolution by natural selection was most famously proposed by which scientist?

- A) Gregor Mendel
- B) Louis Pasteur
- C) Charles Darwin**
- D) James Watson

5. What is the basic unit of heredity that is passed from parents to offspring?

- A) Chromosome
- B) Mitochondrion
- C) Gene**
- D) Ribosome

6. Which type of cell lacks a true nucleus and membrane-bound organelles?

- A) Eukaryotic cell
- B) Plant cell
- C) Animal cell
- D) Prokaryotic cell**

7. What is the term for the process by which organisms change over time through inherited traits?

- A) Adaptation
- B) Mutation
- C) Metamorphosis

D) Evolution

8. Which part of a plant cell is responsible for photosynthesis?

- A) Nucleus
- B) Vacuole
- C) Cell wall

D) Chloroplast

9. What is the primary role of enzymes in biological systems?

- A) Storing energy
- B) Building cell structures

C) Catalyzing biochemical reactions

- D) Transporting molecules

10. The study of the interactions between living organisms and their environment is called:

- A) Genetics

B) Ecology

- C) Physiology
- D) Zoology

11. Which of the following is a fundamental component of proteins?

- A) Nucleotides
- B) Fatty acids

C) Amino acids

- D) Monosaccharides

12. What is the process by which a cell divides into two identical daughter cells?

- A) Meiosis
- B) Fertilization

C) Mitosis

- D) Transcription

13. Which kingdom includes organisms like bacteria and archaea?

- A) Plantae
- B) Fungi
- C) Protista

D) Monera

14. What is the primary function of red blood cells in vertebrates?

A) Fighting infection

B) Transporting oxygen

C) Clotting blood

D) Producing antibodies

15. The process by which plants absorb water and minerals from the soil is called:

A) Transpiration

B) Germination

C) Absorption

D) Respiration