Advanced Biology Foundations

Biology · Answer Key · 10 Questions

1. Which organelle is primarily responsible for the synthesis of lipids and the detoxification of drugs within a eukaryotic cell?

A) Rough endoplasmic reticulum
B) Smooth endoplasmic reticulum
C) Golgi apparatus
D) Lysosome

2. What is the primary function of the enzyme DNA polymerase III in prokaryotic DNA replication?

A) Unwinding the DNA helix
B) Synthesizing new DNA strands by adding nucleotides
C) Repairing DNA damage
D) Terminating the replication process

3. In the context of cellular respiration, which molecule serves as the final electron acceptor in the electron transport chain?

A) Oxygen
B) Carbon dioxide
C) Water
D) NAD+

4. Which phase of meiosis involves the separation of homologous chromosomes to opposite poles of the cell?

A) Prophase I
B) Metaphase I
C) Anaphase I
D) Anaphase II

5. What is the structural unit of a muscle fiber that shortens during contraction, defined as the region between two Z-lines?

A) Myofibril
B) Sarcomere
C) Myosin filament
D) Actin filament

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6. Which hormone, secreted by the pancreas, is primarily responsible for increasing blood glucose levels by promoting glycogenolysis in the liver?

A) Insulin
B) Glucagon
C) Thyroxine
D) Cortisol

7. What type of chemical bond is primarily responsible for maintaining the secondary structure of proteins, such as alpha-helices and beta-pleated sheets?

A) Covalent bonds
B) Ionic bonds
C) Hydrogen bonds
D) Disulfide bridges

8. Which process involves the movement of water across a semipermeable membrane from an area of low solute concentration to an area of high solute concentration?

A) Active transport
B) Facilitated diffusion
C) Osmosis
D) Exocytosis

9. In photosynthesis, where do the light-dependent reactions specifically occur within the chloroplast?

A) Stroma
B) Thylakoid membranes
C) Outer membrane
D) Intermembrane space

10. Which nitrogenous base is found in RNA but is replaced by thymine in DNA?

A) Adenine
B) Guanine
C) Cytosine
D) Uracil

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