

Time: 30 minutes

Total: 15 points

*Please choose the CORRECT answer for each question, then fill in your answer in the attached bubble sheet.*

1. What is the basic unit of heredity?

- A. Chromosome
- B. Allele
- C. Gene
- D. Nucleotide

2. Which of the following is a function of the cell membrane?

- A. Protein synthesis
- B. Storage of genetic material
- C. Energy production
- D. Regulation of substances entering and leaving the cell

3. Which type of RNA carries amino acids to the ribosome during protein synthesis?

- A. mRNA
- B. rRNA
- C. tRNA
- D. snRNA.

4. Which type of bond is formed between the amino group and the carboxyl group of adjacent amino acids in a protein?

- A. Ionic bond
- B. Disulfide bond
- C. Hydrogen bond
- D. Peptide bond

5. If a cell is placed in a hypertonic solution, what is the most likely outcome?

- A. The cell will swell and burst.
- B. The cell will remain unchanged.
- C. The cell will lose water and shrink.
- D. The cell will actively pump water inward.

6. Which phase of mitosis is characterized by the alignment of chromosomes at the center of the cell?

- A. Prophase
- B. Anaphase
- C. Metaphase
- D. Telophase

7. Which nitrogenous base is found in RNA but not in DNA?

- A. Adenine
- B. Cytosine
- C. Thymine
- D. Uracil

8. What is the main function of enzymes in biological systems?

- A. Store genetic information
- B. Act as energy sources
- C. Catalyze biochemical reactions
- D. Form cell membranes

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9. Which organelle is responsible for modifying and packaging proteins for secretion?

- A. Lysosome
- B. Nucleolus
- C. Golgi apparatus
- D. Cytoskeleton

10. In the electron transport chain, oxygen functions as:

- A. The initial electron donor
- B. A substrate for ATP synthase
- C. The final electron acceptor
- D. A proton pump

11. Which process increases genetic variation during meiosis I?

- A. Independent assortment of chromosomes
- B. DNA replication
- C. Cytokinesis
- D. Binary fission

12. Which cellular structure is directly responsible for organizing microtubules during cell division in animal cells?

- A. Centriole
- B. Lysosome
- C. Peroxisome
- D. Rough endoplasmic reticulum

13. A researcher observes that increasing substrate concentration no longer restores the maximum reaction velocity in the presence of an inhibitor. Which type of inhibition is most consistent with this observation?

- A. Competitive inhibition
- B. Noncompetitive inhibition
- C. Reversible active-site inhibition
- D. Substrate-level inhibition

14. During DNA replication, which enzyme is primarily responsible for synthesizing the new DNA strand by adding nucleotides in the 5' → 3' direction?

- A. DNA ligase
- B. DNA polymerase III
- C. Helicase
- D. Primase

15. Which of the following statements about transcription in eukaryotes is correct?

- A. It occurs in the cytoplasm.
- B. It requires ribosomes.
- C. It produces a primary RNA transcript that undergoes processing.
- D. It directly produces a functional protein.

-----GOOD LUCK-----