B-949: Biology

Practice Exam

Generated on June 27, 2025
Difficulty: Medium

Important Notes:

- Answer all questions to the best of your ability
- Show all work for partial credit
- Use additional paper if needed
- Time limit: 90 minutes

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1. Describe the process of exocytosis, including the roles of the Golgi apparatus and the cytoskeleton. Explain how this process differs from endocytosis, and provide one specific example of a biological function reliant on exocytosis.

2. Compare and contrast the structures and functions of mitochondria and chloroplasts. Discuss the endosymbiotic theory and how it explains the origins of these organelles. Include at least two pieces of evidence supporting the theory.

3. Explain the fluid mosaic model of the cell membrane. Detail the roles of phospholipids, proteins, and carbohydrates in maintaining membrane structure and function. How does membrane fluidity impact cellular processes?

4. Describe the different types of cell junctions found in animal cells (tight junctions, adherens junctions, desmosomes, gap junctions) and explain their specific roles in maintaining tissue integrity and communication between cells. Provide an example of a tissue type where each junction type is particularly important.

5. Discuss the process of signal transduction, focusing on the role of receptor proteins in the cell membrane. Explain how a signal from outside the cell can lead to a change in gene expression within the cell's nucleus. Provide a specific example of a signaling pathway.