

Midterm Exam – Directions and Possible Essay Questions

Part A: Answer each of the following six questions in two to three sentences each. Each question is worth up to 5 points (30 points total).

Part B: One of the following questions will appear on the exam. Write an essay addressing that question (35 points).

1. Compare and discuss the ways of conceptualizing living phenomena advanced by Xavier Bichat (traditionally seen as a vitalist) and Claude Bernard (traditionally seen as a mechanist). Discuss the implications of each of their frameworks for the development of biology.
2. In advancing his theory of the cell, Theodor Schwann considered himself to be a mechanist. What features of his theory exemplify a mechanist viewpoint? What about his theory led others to view him as a vitalist? Explain how you would characterize his view in the context of the vitalist-mechanist controversy.
3. Mechanistic physiology, beginning with Harvey and Descartes, and continuing with Bernard and others in the 19th century, rejected Aristotelian teleological thinking. Explain the contrast between Aristotelian teleology and mechanistic physiology. Some have seen Darwin as providing an alternative teleological perspective, one fundamentally different from Aristotle and perhaps compatible with a broadly mechanistic physiology. In what sense does Darwin provide a teleological framework for physiology?

Part C: One of the following questions will appear on the exam. Write an essay addressing that question (35 points).

1. Why was Darwin more impressed with William Paley's Watchmaker Argument, which Paley viewed as an argument for special creation, than with Lamarck's evolutionary theory? Explain the significance of the watchmaker argument for Darwin's own thinking and how he proposed to account for the phenomena on which Paley focused.
2. Darwin anticipated objections to his proposal that species originated through natural selection and confronted additional objections that were raised by others after he published his theory. What were the most important objections to his theory and how did he try to answer them?
3. Had Darwin read and understood Mendel's paper, he could have answered one of the major objections to his theory. But when Mendel's work was rediscovered 35 years later, it was taken as the basis for an alternative to Darwin's own account of the origin of species. Explain the relevance of Mendel's work to Darwin's theory, why it could be construed as providing an alternative to his proposal and how it was eventually integrated with it.