

Examination One: Due Monday 29 September before Midnight California Time

Notes: Although there is a minimum word count of 2,000 words for this exam, you will find that it is likely going to require more than the minimum to fully answer the question. You may not copy or quote from any source. All information must be re-written in your own words. Answer all questions. Point value: 100 points. Read the course Style Guide for detailed instructions of structure and format. Exams must be submitted by the due date and time. **Late Exams are NOT accepted without prior approval. Submit early to Turnitin.com**

Do not include the question(s) in your essays and exams.

Question 1: Cells and Cell Membranes (25 points)

Describe cell structures and functions and how plant and animal cells are different. Include in your answer:

- the molecular structure of cell membranes, with special reference to functions of proteins and phospholipids and the mechanisms by which molecules are able to pass through cell membranes
- the specialized membrane structures and functions of the cell nucleus, mitochondria, endoplasmic reticulum and the Golgi apparatus.
- differences between plant and animal cells.

Question 2: Molds and Slime Molds (25 points)

Describe the problematic, historical grouping of organisms as members of the kingdom Fungi using Dictyostelium and Physarum (Amoebozoa), Allomyces (Blastocladiomycota) and Rhizopus (Zygomycota). Include in your answer:

- the contrasting structures, stages and life cycles of each
- the characteristics which define fungi and their relationships within the tree of life

Question 3: Photosynthesis (25 points)

Describe the structure of the chloroplast, light capture and the processes of photosynthesis. Include in your answer:

- a description of light harvesting complexes and the two photosystems
- the nature of the electron transport chain and its function
- the events of carbon fixation, the “problem” with RubisCO, and the solution to this problem in the plants of prairies

Question 4: Distinguishing Features of Plants: What is a plant? (25 points)

Describe the features of true plants (kingdom Plantae) that distinguish them from their algal ancestors. Consider the following when creating your essay:

- a comparison of the stages of the life histories of a chlorophyte alga (Ulothrix), a streptophyte alga (Chara) and a moss.
- a description of the distinguishing characteristics (structures and life histories/life cycles) of the bryophytes that define them as true plants (Plantae/Embryophyta), separating them from algae.

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