

STUDY QUESTIONS FOR EXAM 1

The following are some sample questions that you might expect to be found on the first exam. Use these examples to generate other questions like them, then answer all the questions and you will be well prepared for the first examination.

Briefly describe and/or identify the following: *Naegleria fowleri*, heterokont, acellular, alveoli, pantonematic, *Trichonympha*, hypocone, auxomorphy, attractophore, chrysolaminarin, paraflagellar rod, haptoneme, undulating membrane, hemidesmosome, mitochondrion, lamellar cristae, *Amoeba proteus*, rough endoplasmic reticulum, synergy, structural grades, filopodia, lobopodia, granuloreticulopodia, Chrysoomonadida, Opaninida, falx, stichonematic, ribbon flagellum, tinsel flagellum, cellulose plates, microtubules, paired rod organ, cytostome, chlorophyll a, chlorophyll b, chlorophyll c, *Ochromonas*, totipotent, osmotrophic, ingestive, absorptive, photoauxotrophic, etc.

This course is devoted to the study of the protozoa (first animals), yet over one-half of the groups we have discussed to date are "phytoflagellates." How does our understanding of Whittaker's five kingdom plan justify including such organisms in Biology 450?

In general terms, describe the ultrastructure of a "typical" protozoan and show how it generally conforms to that of a eukaryotic cell. In what way(s) might the dinoflagellates represent an exception to this generalization.

Symbiotic ways of life are common solutions to locations of "life with moisture." Give examples that we have studied to this point of protistan organisms that have parasitic, commensal, and/or mutualistic relationships with other organisms.

The orders Euglenida, Chrysoomonadida, Dinoflagellida, Rhizomastigida, Kinetoplastida, and Metamonadida can each be described. Describe four (4) of these taxonomic units and give a representative genus for each group. UNDERLINE the single, most distinctive feature of each group. A drawing of a representative organism may aid your description.

Answer the following with + if everything given is true or - if all or part is false.

- _____ Ejectisomes are found in the Chrysoomonadida.
- _____ There can be little doubt that the Sarcomastigophora enjoy a monophyletic origin.
- _____ Mitochondria of flagellated protozoa most typically contain vesiculate cristae.
- _____ All sarcomastigophoreans show some type of mastigonemes or flagellar hairs when flagella are present.
- _____ Haptonemes are found in the Silicoflagellida.
- _____ The Metamonadida are known to have two isokont, acronematic flagella.
- _____ According to Lynn Margulis, there is absolutely no difference between a eukaryotic cilium or flagellum and an undulipodium.
- _____ Opalinids have eukaryotic nuclei and perkinetal fission.
- _____ Most members of the Sarcomastigophora have specialized in a parasitic or symbiotic way of life.
- _____ Dr. Antipa is a lumper!

STUDY QUESTIONS FOR EXAM 2

Do not forget to include all of the assigned text to prepare for the exam. Although most of the material will be from the material presented in class AND the text, I will ask some questions covered in the text that we may not have time to cover in detail in class. The following are some sample questions that you might expect to be found on the second exam. Use these examples to generate other questions like them, then answer all the questions and you will be well prepared for the examination.

Be sure to include in your short answer, the relevance of these points; in other words, why did we bring these points up, are they an special example of a basic biological point? Briefly describe and/or identify the following: *Plasmodium*, syzygy, toxicyst, polaroplast, protomerite, *Vorticella*, kinetodesmal fiber, *Babesia*, rhoptries, gamogony, secondary meridian, primary meridian, apical complex, micropores, parasomal sacs, mucocysts, toxicysts, director meridian, *Conchophthirus*, *Nassula*, postciliary microtubules, *Nosema*, *Myxobolus*, ookinete, *Toxoplasma*, Hymenostomatida, *Stentor*, Heterotrichida, Oligohymenophorea, *Euplotes*, *Vorticella*, suctorians.

List and briefly describe the general characteristics of the Phylum Ciliophora, AND with the use of an example, explain the significance of our understanding of stomatogenesis and the use of this information in ciliate systematics.

Describe the process of sexual reproduction by conjugation as it occurs in the ciliated protozoan, *Paramecium aurelia*., AND explain the significance of this process to our understanding of the SPECIES CONCEPT, as it is used in the protozoa.

What is the difference between a morphological species and a biological species?

The taxons Eugregarinida, Schizococcidia, Cnidospora, Polyhymenophorea, and Scuticociliatida can each be described. Describe four (4) of these taxonomic units and give a representative genus for each group. UNDERLINE the single, most distinctive feature of each group. A drawing of a representative organism may aid your description.

Answer the following with + if everything given is true or - if all or part is false.

- _____ All cnidosporans form spores, but no schizococcidians form spores.
- _____ *Toxoplasma* shows nuclear dimorphism.
- _____ *Tetrahymena* shows nuclear dimorphism.
- _____ All members of the Cnidospora have specialized in a parasitic way of life.
- _____ A contractile vacuole pore is a permanent structure in members of the Ciliophora.
- _____ Micropores resemble parasomal sacs in structure and probably in function.
- _____ The apical complex is distinctive of members of the Myxozoea.
- _____ Members of the Scuticociliatida are associated on the basis of the development of their oral anlage.
- _____ *Pleuronema* stomatogenesis develops from a prominent director meridian.
- _____ All members of the Apicomplexa have specialized in a symbiotic way of life.

STUDY QUESTIONS FOR EXAM 3

Do not forget to include all of the assigned text to prepare for the exam. Although most of the material will be from the material presented in class AND the text, I will ask some questions covered in the text that we may not have time to cover in detail in class. The following are some sample questions that you might expect to be found on the third exam. Use these examples to generate other questions like them, then answer all the questions and you will be well prepared for the first examination.

Be sure to include in your short answer, the relevance of these points; in other words, why did we bring these points up, are they an especial example of a basic biological point? Briefly describe and/or identify the following:

- | | |
|-----------------------|--------------------------|
| a. clathrocyst | g. semi-autonomous |
| b. toxicyst | h. mucocyst docking |
| c. inverted kinety | i. Sarcomastigophora |
| d. undulipodium | j. floc |
| e. secondary lysosome | k. logistic growth curve |
| f. photoauxotrophic | l. mixed liquor |

In what ways do protozoa use chemicals to sense their environment? How do we know this?

Describe two (2) examples of polymorphism that are seen in the protozoa.

Recall the levels of organization we discussed with respect to the organization of the protozoa (ie. the principal of structural grades). With this in mind, select a specific protozoan and describe in detail a component(s) which is (are) representative of each level of organization. Explain how auxomorphy relates to the principle of structural grades?

Diagram and completely label a cross section of a eukaryotic flagellum. Explain how the flagellum develops its motive force, and provide evidence based on one experiment to support this explanation.

Give one (1) example of synergy at the protistan level and show how the example you have chosen exemplifies the eukaryotic cell as an individual organism.

At the left margin, answer the following with + if everything given is true or - if all or part is false.

- _____ Examples of polymorphism are seen in all four major phyla of the protozoa.
- _____ Some opalinids and all ciliates have dimorphic nuclei.
- _____ Metamonads have eukaryotic, a golgi apparatus (or dictyosome) and carry out asexual reproduction by perkinetal fission.
- _____ Parasomal sacs of the Ciliophora and micropores of the Cnidospora are both thought to be structures involved in nutrient absorption.
- _____ Contractile vacuoles and contractile vacuole pores are present in some marine protozoa. In the Ciliophora, a contractile vacuole pore is a permanent structure.
- _____ All sarcomastigophoreans have mastigonemes when flagella are present.
- _____ Peripheral triplets slide during the ciliary or flagellar beat.
- _____ Monoxenic growth of a protozoan refers to the condition where a population of organisms of a given species, often cultivated from an individual organism, is growing in the presence of another population of organisms of a different species. The medium used to support the monoxenic growth contains no other living organisms.
- _____ All protozoa are members of the Kingdom Protista.
- _____ Polymorphism is seen in all four subphyla of the protozoa.