EXAM I-A. BIO 213. SPRING 2004 **Name:**

The exam is worth 100 points. It consists of 36 multiple choice questions worth 2.5 points each and 2 brief answer questions worth 5 points each. You will be given a choice of four brief answer questions, choose the two that you feel more comfortable answering. There are no extra-points. Read carefully each question and make sure you correctly fill your answer in the scantron. Also, fill in your name and **UT-eID** correctly. You have until 12:00 PM to work on your exam. Good luck!

1. The use of a binomial system of classification for each species known on Earth allows for an standard and precise way of communicating about a given organism
a. because there is only one binomial name (scientific name) for each species and this is always the same throughout the world.
b. because the first word of the binomial name is the genus and this is always unique.
c. because the binomial name reflects the most unique characteristic of a species.

2. From the following list of bird scientific names, choose the one that correctly portrays the *standards* developed by taxonomists to identify (name) species.
a. Vireo atricapillus b. *Vireo Solitarius* c. *Vireo nelsoni* d. vireo belli

3. It is defined as the evolutionary history of a species or group of related species
a. Phylogeny b) Systematics c) Phenetics d) Parsimony

4. A researcher uses cladistics to understand the evolutionary history of a family of sea urchins. He uses a computer program to analyze the binary character data he has collected for the family to obtain a phylogenetic inference. The data analysis produces three possible phylogenetic hypotheses to represent the evolutionary history of the sea urchin family. Using the principle of parsimony which phylogenetic hypothesis is he going to choose as the most likely?
a. The one that requires the fewest number of evolutionary events in the form of shared derived characters.
b. The one that requires the highest number of evolutionary events in the form of shared derived characters.
c. The one that best fits his preconceived idea of the evolution of sea-urchins.

5. Endothermy has evolved several times independently along the vertebrate clade. This statement implies
a. endothermy evolved in unrelated groups of vertebrates due to convergent evolution.
b. endothermy is considered an analogous character in those vertebrate groups.
c. all of the above.

6. Prokaryotes lack
a. DNA. b. cells. c. an organized nucleus d. cytoplasm

7. Prokaryotes use these structures to adhere to one another or the substratum
a. Flagella and pili b. Pili and capsule c. Cell wall and pili d. Flagella and endospore

8. In this domain, none of the organisms engage in sexual reproduction
a. Eubacteria b. Archaebacteria c. Protista d. Animalia

9. In regard to their metabolism, most organisms in nature are
a. Photoautotrophs b. Chemoautotrophs c. Chemoheterotrophs d. Photoheterotrophs

10. All of the diseases mentioned below are examples of prokaryote parasitism on humans, *except*
a. Salmonellosis b. Botulism c. Pneumonia d. Malaria

11. Organisms belonging to this group live in areas of high humidity (e.g. water, moist soil or moist interiors of other organisms)
a. Protista b. Amphibia c. Animalia d. Fungi

12. Organisms in both of these taxa can have multicellular or unicellular organization.
a. Fungi and Protista b. Protista and Archaebacteria c. Animalia and Plantae

13. In this phenomenon, species have both a multicellular haploid stage and a multicellular diploid stage.
a. Syngamy b. Endosymbiosis c. Alternation of generations d. Meiosis

14. Meiosis evolves for the first time in the history of life among
a. Archaebacteria b. Protists c. Fungi d. Eubacteria

15. Why are protists an important part of the global carbon cycle and marine food chain?
a. They have high species diversity
b. They are numerically abundant
c. They have the ability to parasitize humans
d. They have the ability to undergo meiosis

16. During the “Silurian-Devonian explosion”, what occurred?
a. Earliest fossils of plant spores are found.
b. The gymnosperms diversify rapidly and occupied dry habitats.
c. Most major lineages of land plants appear in the fossil record.
d. The continents were covered by coal forming forests.

17. These organisms are examples of land plants with vascular tissue and leaves but seedless.
a. Ferns b. Gymnosperms c. Angiosperms d.Mosses

18. The appearance of cuticle and stomata correlated with what event in the evolution of land plants?
a. The first erect growth forms b. The first woody tissues c. Growth on land
d. A drastic reduction in photorespiration

19. In plants, the multicellular diploid stage is known as the
a. gametophyte b. sporophyte c. seed d. pollen

20. What do pollen grains contain?
a. male gametophyte b. female gametophyte c. male sporophyte d. sperm

21. The C4 and CAM metabolism is an adaptation of plants to live in dry environments as they reduce the effect of photorespiration which is triggered at the onset of hot weather. Why is it important for plants to reduce the effect of photorespiration?
a. Because during photorespiration, some of the ATP produced during photosynthesis by plants is consumed.
b. Because photorespiration produces toxic carbon compounds by oxygenation.
c. All of the above.

22. The organization of *most* fungi is characterized by the following
a. haploid genome, multicellularity, construction of hyphae
b. diploid genome, multicellularity, construction of hyphae
c. haploid genome, unicellularity, construction of hyphae

23. Fungi are more closely related to animals than plants because they share the following characteristics with animals
a. Presence of cell walls with chitin, glycogen, and flagellated gametes
b. Presence of chitin, glycogen, and flagellated gametes/spores
c. Presence of extracellular digestion, chitin, glycogen, flagellated gametes/spores

24. In these organisms a heterokaryotic stage is observed during sexual reproduction
a. Fungi b. Protista c. Plantae d. Animalia

25. This type of fungi/plant association delivers nitrogen to plants, occurs in cold, northern habitats and is mainly driven by fungi species belonging to the group Basidiomycota.
a. Ectomychorrizae b. Arbuscular mychorrizae c. Endomychorrizae

26. In this fungi group, the mycelia attaches together during reproduction and many species form arbuscular mychorrizae with plants
a. Zygomycota b. Basidiomycota c. Chytridiomycota d. Ascomycota

27. These organisms have a diploid genome, are multicellular, have a complex architecture and engage in gastrulation during embryogenesis
a. Protists b. Animals c. Plants d. Fungi

28. All animals other than sponges have both _____ and tissues and are called eumatozoans
a. multicellularity b. choanocytes c. symmetry d. circulatory systems

29. One characteristic unique to animals is
a. sexual reproduction b. production of a zygote c. presence of Hox genes
d. having a diploid genome

30. Which of the following is true of all bilaterally symmetric animals?
a. They are tripoblastic, meaning they have three embryonic tissue layers
b. They have coelems
c. They exhibit the protostome pattern of development
d. They exhibit the deuterostome pattern of development

31. The general evolution and diversification of animals is driven by the evolution of structures and functions that further adapt them to
a. movement and feeding specializations to capture prey
b. colonization of terrestrial habitats
c. absorption of nutrients
d. competition with other species

32. All of the following characteristics are unique to chordates, *except*
a. notochord b. pharyngeal slits c. muscular, postanal tail d. presence of body cavity

33. All of the following characteristics are shared by all vertebrates, *except*
a. cranium b. jaws c. neural crest d. high degree of cephalization

34. The most diverse group of vertebrates are the
a. bony fishes b. lampreys c. birds d. mammals

35. The evolution of this key innovation (within the ancestor of the Amphibia) allowed the first incursion into terrestrial environments within vertebrates
a. jaws b. amniotic egg c. limbs d. endoskeleton

36. The following characteristics of vertebrates demonstrate a trend for a more active lifestyle, *except*
a. high degree of cephalization
b. chambered heart
c. closed circulatory system
d. amniotic egg

Choose 2 of the following brief answer questions. Use the back of the page to write your answers. **Mention the number of the question you have chosen in your answer.**

1. Compare the metabolism of protists and animals. Mention one similarity and two differences

2. Mention three physical similarities between mitochondria/chloroplasts and prokaryotes that have been used to provide evidence to the endosymbiotic theory

3. Why are fungi essential to maintain the global carbon cycle?

4. Why are hox genes important for the capacity of adaptation in animals?