**Midterm Exam** Name: ID:

**True/False Questions (1 point each question)**

1. Darwin's evolutionary theory differs from Lamarck's in being a variational rather than transformational theory. **TRUE**

2. The most direct evidence for Darwin's theory of perpetual change is the fossil record. **TRUE**

3. Recent studies indicate that the traditional naming of unicellular eukaryotes as "Protista" is not a valid taxonomic group, but may comprise 10 or more phyla.

**TRUE**

4. Character states that are found in a study group but are absent from an outgroup are defined as ancestral characters. **FALSE**

5. The process of endosymbiosis may have resulted in eukaryotic cells by bacteria engulfing aerobic bacteria with enzymes that processed oxygen for energy transformations. **TRUE**

6. Most of the hydrozoans are colonial marine animals with both an asexual polyp and a sexual medusa stage in their life cycle. **TRUE**

7 The majority of sponges are colonial, and most are of the leuconoid body type. **TRUE**

8 The neuromuscular system first evolved in the cnidarians. **TRUE**

9 Most turbellarian flatworms are free-living, but the flukes and tapeworms are all parasitic. **TRUE**

10. The lophotrochozoans are now believed to include the Sipuncula, Cycliophora, Brachiopoda, Ectoprocta, and Phoronida. **TRUE**

11. Chitons have eight plates embedded in their dorsal surface. **TRUE**

12. Molluscs evolved in fresh water, and therefore the majority of species are found in fresh water. **FALSE**

13. The Errantia generally have a less well-developed head than other annelids.  **FALSE**

14. The annelids, molluscs, and arthropods are considered members of Protostomia. **TRUE**

15. Earthworms possess paired fleshy appendages called parapodia. **FALSE**

16. The Errantia have separate sexes, but the earthworms and leeches are hermaphroditic. **TRUE**

17. Annelids may be characterized as protostomes, with spiral cleavage and mosaic development. **TRUE**

18. The terrestrial tardigrades cannot withstand harsh environmental conditions. **FALSE**

19. Nematodes have circular muscles and longitudinal muscles in their body wall. **FALSE**

20. Humans can get Ascaris parasites by ingestion of contaminated vegetables. **TRUE**

**Multiple Choice Questions (1 points each question)**

1. Which of the following is not an inference of Darwin's theory of natural selection?

A. There exists a struggle for existence among members of a population.

B. There is differential survival and reproduction among varying organisms in a population.

**C.** Characteristics that are harmful to survival are often advantageous for reproduction.

D. Over many generations, differential survival and reproduction of varying organisms generates new species.

2. The theory of evolution by natural selection was proposed by

A. Darwin and Lyell.

**B.** Darwin and Wallace.

C. Darwin and Malthus.

D. Darwin and Lamarck.

3. Darwin's finches represent a good example of

A. punctuated equilibrium.

B. sympatric speciation.

**C.** adaptive radiation.

D. phyletic gradualism.

4. Characteristics of deuterostomes include
A. blastopore first become a mouth.
B. spiral cleavage.
C. mosaic embryo.
**D.** none of the above

5. Large size
A. buffers an animal against temperature fluctuations.
B. provides greater protection against predation.
C. permits more efficient use of metabolic energy.
**D.** all of the above

6. What other characteristics might be present in an organism that moves in a certain direction, such as toward food?

**A.** cephalization with polarity of the body axis

B. radial symmetry with concentration of nerves

C. a mouth located on the midventral region away from the head

D. none of the above

7. The main supportive material in arthropods, nematodes, and annelids is

A. loose connective tissue only.

B. bone.

C. cartilage.

**D.** cuticle.

8. The man who developed the present system of classification was

A. Aristotle.

B. Ray.

**C.** Linnaeus.

D. Darwin.

9. Which of the following best describes the phylogenetic position of the single-celled eukaryotic organisms?

A. They form a monophyletic phylum, the Protozoa, within the kingdom Ammalia.

B. They form a monophyletic kingdom, the Protista, separate from the kingdom Animalia.

C. They form a monophyletic group within the Monera.

**D.** They do not form a valid monophyletic taxon at any level of the Linnaean hierarchy.

10. Which of the following represents the arrangement of microtubules in an axoneme of a cilium?

A. nine peripheral triplets of microtubules

**B.** nine peripheral pairs of microtubules plus one central pair

C. nine peripheral triplets plus one central pair

D. nine peripheral pairs plus two central pairs

11. The protozoan *Trypanosoma* causes human

A. malaria.

B. amebic dysentery.

**C.** African sleeping sickness.

D. birth defects.

12. The cells of a sponge that are responsible for water flow and capture of some particles are the

A. myocytes.

B. archaeocytes.

**C.** choanocytes.

D. pinacocytes.

13. In sponges, respiration and excretion of various molecules is accomplished by

**A.** diffusion.

B. active transport.

C. tracheoles.

D. choanocytes.

14. Sea anemones and corals lack

A. a sexual stage.

B. an asexual stage.

C. a polyp stage.

**D.** a medusa stage.

15. In cnidarians, extracellular digestion occurs in the

**A.** gastrovascular cavity.

B. gastrodermal cells.

C. mesoderm.

D. nematocysts.

16. Some characteristics of flatworms and ribbon worms are

**A.** bilateral symmetry, triploblastic, acoelomate.

B. acoelomate, diploblastic, bilateral symmetry.

C. radial symmetry, triploblastic, acoelomate.

D. diploblastic, radial symmetry, acoelomate.

17. The nervous system in planaria is

A. absent.

B. a nerve net.

C. a single ventral cord.

**D.** a ladder type.

18. If you are discovered to have an infection of Ascaris worms, your most likely danger is

A. anemia.

B. destruction of tissues as it migrates through your body.

**C.** blockage of the intestines.

D. starvation from lack of nutrition because it is absorbing all your food.

Answer: C

19. The Monoplacophora

A. lack a shell.

B. live in fresh water.

**C.** have several internal organs that are serially repeated.

D. lack a foot.

20. The circulatory system of cephalopods is more efficient than that of other molluscs because

A. it has blood.

**B.** it is closed.

C. cephalopods breathe air.

D. all of these

21. The following characteristics are typical of annelids:

A. segmentation, open circulation, and nephridia.

**B.** segmentation, closed circulation, and nephridia.

C. no anus, nephridia, and coelom.

D. nephridia, coelom, and open circulation.

22. The Errantia

A. belong to the smallest and most evolutionarily derived class of annelids.

B. are mostly freshwater inhabitants.

**C.** consist of active predators and sedentary particle feeders.

D. are hermaphroditic.

23. The larva of polychaetes is

A. lacking.

B. a pilidium.

**C.** a trochophore.

D. a nauplius.

24. The circulatory system in the earthworm

A. is absent.

B. is an open type.

**C.** uses the dorsal vessel as the main pumping organ.

D. has no pumping structure and depends on the action of body muscles to move the blood.

25. The cocoon in the earthworm is produced by the

**A.** clitellum.

B. prostomium.

C. calciferous glands.

D. chloragogen cells.

26. Some typical leech characteristics are as follows:

**A.** anterior and posterior suckers, a clitellum, no setae.

B. setae, clitellum, and separate sexes.

C. parapodia, no setae, and hermaphroditism.

D. anterior and posterior suckers, separate sexes, and setae.

27. Movement in annelids involves

A. longitudinal muscles only.

B. circular muscles only.

**C.** longitudinal and circular muscles.

D. the hydrostatic skeleton only.

28. Nematodes

A. possess flame cells.  B. possess an incomplete digestive tract.

**C.**are dioecious.  D. have external cilia.

29. Elephantiasis is caused by filarial worms that live in the

A. muscles.

**B.** lymphatic system.

C. intestine.

D. lungs.

30 The name "hookworms" is due to the fact they

A. cluster in blood vessels in the liver and clog the veins.

B. burrow constantly through muscle tissues.

C. hook onto the intestine and consume blood and tissue fluids causing anemia.

D. clog the lymph glands and expand the legs and arms.

**E.** have an anterior end that curves dorsally like a hook.

**Fill in the Blank Questions (2 points each question. If answered in Chinese, 0.5 points will be deducted)**

1. A holozoic protozoan ingests food particles by the process of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
**phagocytosis**

2. All digestion in sponges is intracellular and is carried out by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
**archaeocytes**

3. The tall secretory cells around the pedal disc and mouth of Hydra are the \_\_\_\_\_\_\_\_\_\_\_ cells.  **gland**

4.  Most individual turbellarians contain organs of both sexes and are thus termed \_\_\_\_\_\_\_\_\_\_\_\_\_.
**monoecious or hermaphroditic**

5. The edible clams, oysters, and scallops belong to the class \_\_\_\_\_\_\_\_\_\_\_\_\_.
**Bivalve**

6. Class Errantia is a \_\_\_\_\_\_\_\_\_\_\_\_\_ taxon because ancestral oligochaetes arose from the polychaete clade. **Paraphyletic**

7. Nematodes have a fluid-filled pseudocoel that serves as a \_\_\_\_\_\_\_\_\_\_\_\_\_ skeleton. **hydrostatic**

8.

A. intestine;

B. uterus;

C. oviduct;

D. ovary;

E. epidermis;

F. cuticle;

G. ventral nerve cord;

H. excretory duct

**Short answer questions (10 points each, please provide your answers in short sentences)**

1. Comparing to other mollusks, cephalopod has an active lifestyle. What characters of cephalopod are adaptive to its life style?

*The Cephalopods have closed circular system, good vision, highly developed nervous systems, head foot and muscular mantle, which are all adaptive to swimming and predator lifestyle.*

2. Why nematodes are such an important group (please discuss it in terms of their diversity, ecological roles and relations to us)?

*Because nematodes are highly diverse, important ecologically, recycling nutrients; could cause disease in human and cattle; could damage crops;*