

BIO 1130MM

An introduction to Organismal biology
Midterm examination
Worth either 15% or 20% of your final grade

Saturday, October 2, 2010

Part A: Multiple choice questions
20 points (1 point/question)

- a) Fill in the bubbles for your name and student number and BIO1130MM for the course code. Fill in the same information in text in the boxes above the bubbles.
- b) Use only a pencil to fill in the answer sheet. If you erase a question be sure to erase all of the pencil mark. Don't place any marks anywhere on the sheet other than where the bubbles are for personal information or your answers.
- c) Do not place any answers on the question sheet.
- d) This is not an open book exam.
- e) **CAUTION to minimize paper waste this part of the exam has been printed back to back**

NOTE: If you do not fill in the student number and course code as **BIO1130MM** it will be impossible to identify your answer sheet and you will receive a **ZERO** for this part of the exam

BIO 1130MM - Midterm Examination – October 2, 2010
Multiple choice questions - Place your answers on the answer sheet

1. Why does ice float in liquid water?
 - a. Ice always has air bubbles that keep it afloat.
 - ☒ b. Hydrogen bonds stabilize and keep the molecules of ice farther apart than the water molecules of liquid water.
 - c. The crystalline lattice of ice causes it to be denser than liquid water.
 - d. The ionic bonds between the molecules in ice prevent the ice from sinking.
 - e. The liquid water molecules have more kinetic energy and thus support the ice.

2. Which of these conditions are always true of populations evolving due to natural selection?
Condition 1: The population must vary in traits that are heritable.
Condition 2: Some heritable traits must increase reproductive success.
Condition 3: Individuals pass on all traits they acquire during their lifetime.
 - a. Condition 1 only
 - b. Condition 2 only
 - ☒ c. Conditions 1 and 2
 - d. Conditions 2 and 3
 - e. Conditions 1, 2, and 3

3. According to the transmutation of species principle of use and disuse, the form of body parts in offspring
 - a. is not changeable.
 - b. is the result of natural selection.
 - ☒ c. is the result of how much the offspring uses a particular body part.
 - d. is inherited based on phenotypic changes that occur in parents during their lifetime

4. Why did Darwin argue that evidence of extinction supports the theory of evolution?
 - a. It shows that reproduction is more important than survival of the fittest.
 - ☒ b. It shows that the number and types of species have changed over time.
 - c. It shows that nothing lasts forever.
 - d. It shows that lower organisms have died to make way for humans.

5. Which of these is based on a deduction?
 - a. My car won't start.
 - b. My car's battery is dead.
 - c. I lost my car key.
 - d. My car is out of gas.
 - ☒ e. If I turn the key in the ignition while stepping on the gas pedal, then my car will start.

6. Which of the following statements is most consistent with essentialism?
 - a. All living things have changed slowly over time and this explains the gradual changes in the rock layers.
 - b. All living things on the planet have remained unchanged since they were first placed on the plant
 - ☒ c. A characteristic set of unchanging properties defines every living organism found on earth.
 - d. extinctions are the result of catastrophic events like the biblical flood.
 - e. Species changed as they dispersed from the center of creation.

7. Which naturalist(s)/biologist(s) finally disproved spontaneous generation and proposed the germ theory.
- ☒ a. Pasteur
 - c. Lamarck
 - b. Leclerc
 - d. Schleiden and Schwann
 - e. Huxley
8. Which gas was originally missing in the Miller-Urey experiments
- a. Methane (CH_4)
 - b. Hydrogen (H_2)
 - c. Ammonia (H_3)
 - ☒ d. Carbon dioxide (CO_2)
 - e. None of the above.
9. Which one of the following predictions follows from the sexual selection hypothesis for why giraffes have long necks?
- ☒ a. In contests over females, the male with the longest neck should have an advantage over the other males.
 - b. Young males that are given extra amounts of high-quality food should grow particularly long, strong necks.
 - c. In contests over females, the best-nourished male should always, or almost always, win.
 - d. In natural populations, female neck length should decline over time.
10. Carbon is an important element for biology because
- a. It has the ability to form six covalent bonds.
 - ☒ b. Of the variety of carbon skeletons and functional groups that can be built on them.
 - c. Carbon is so rare, organisms conserve it highly.
 - d. It has very high electronegativity and forms highly stable bonds.
11. The “father of taxonomy” worked with these organisms
- a. Vertebrates
 - b. All animals
 - ☒ c. Plants
 - d. Both plants and animals
 - e. Fungi
12. What was the major stumbling block for the acceptance of natural selection as a mechanism for evolution when proposed by Darwin?
- ☒ a. lack of a plausible theory of heredity
 - b. lack of a fossil record
 - c. lack of observational and experimental data
 - d. strong evidence for inheritance of acquired traits

13. At what temperature is water at its densest?
- a. 0°C
 - b. 32°C
 - c. 212°C
 - X d. 4°C**
 - e. 100°C
14. Australia and Eurasia each have a mouse-like mammal, one a marsupial, the other a placental. This is an example of
- a. long-distance migration.
 - b. adaptive radiation.
 - c. coincidence.
 - X d. convergent evolution**
15. What gives rise to the cohesiveness of water molecules?
- a. ionic bonds
 - X b. hydrogen bonds**
 - c. hydrophobic interactions
 - d. nonpolar covalent bonds
 - e. both hydrophobic interactions and ionic bonds
16. Which of the following is the true unit of Darwinian evolution; in other words, which of these is subject to meaningful evolutionary change by natural selection?
- a. phenotypes
 - b. communities
 - X c. populations**
 - d. individuals
17. Why is it important that an experiment include a control group?
- X a. Without a control group, there is no basis for knowing if a particular result is due to the variable being tested or to some other factor.**
 - b. The control group is the group that the researcher is in control of; it is the group in which the researcher predetermines the nature of the results.
 - c. The control group provides a reserve of experimental subjects.
 - d. A control group assures that an experiment will be repeatable.
 - e. A control group is required for the development of an "if, then" statement
18. The recent transition fossil, *Puijia darwini*, found in the Canadian north is an important transition fossil because it demonstrates which of the following transitions?
- a. Marine to terrestrial
 - b. Freshwater to terrestrial
 - X c. Terrestrial to water**
 - d. Terrestrial to air

19. Which of these theories, proposed by Jean Baptiste de Lamarck, did Darwin reject in his theory of evolution?
- a. the relationship between organisms and their environment
 - b. the passing of changes from one generation to the next
 - X c. the mechanism by which species change**
 - d. the concept of species change
20. Panspermia is the name given to the hypothesis that
- a. different forms of life are present in outer space that may not have seeded early Earth.
 - X b. very simple forms of life are present in outer space and may have seeded early Earth.**
 - c. life on Earth could have started biotically.
 - d. life on Earth could have started abiotically.