BIO 1130FF

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 BIO1130FF 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 **BIO1130FF** it will be impossible to identify your answer sheet and you will receive a **ZERO** for this part of the exam

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. What gives rise to the cohesiveness of water molecules?
    a. ionic bonds
    b. hydrogen bonds
    c. hydrophobic interactions
    d. nonpolar covalent bonds
    e. both hydrophobic interactions and ionic bonds

3. The Irish elk and the mammoth are two of the 23 large animals that this scientist found as used as evidence for this process.
    a. Spontaneous generation
    b. Scala naturae
    c. Extinction
    d. Transmutation of species
    e. Transition fossils

4. Which of the following best describes a Linnean binomen?
    a. A combination of a noun and adjective in Latin
    b. A unique name of all living species.
    c. Two words.
    d. both a and b.
    e. both a and c.

5. 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
    c. populations
    d. individuals

6. 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

7. 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.

8. 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.

9. 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.

10. 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
   c. Terrestrial to water
   d. Terrestrial to air

11. 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
   c. the mechanism by which species change
   d. the concept of species change

12. The “father of taxonomy” worked with these organisms
   a. Vertebrates
   b. All animals
   c. Plants
   d. Both plants and animals
   e. Fungi

13. 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.

14. Which naturalist(s)/biologist(s) finally disproved spontaneous generation and proposed the germ theory.
    a. Pasteur
    c. Lamark
    b. Leclerc
    d. Schleiden and Schwann
    e. Huxley

15. Protobionts (protocells) are
    a. a group of abiotically produced innorganic molecules surrounded by a membrane-like structure.
    b. a group of abiotically produced organic molecules surrounded by a membrane-like structure.
    c. a group of biotically produced innorganic molecules surrounded by a membrane-like structure.
    d. a group of biotically produced organic molecules surrounded by a membrane-like structure.

16. 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.

17. Which of the following is the correct typographic presentation for the genus species name for the Canadian Beaver?
    a. *castor Canadensis*
    b. Castor *Canadensis*
    c. Castor canadensis
    d. *Castor canadensis*

18. 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

19. Two species that belong to the same genus must also belong to the same
    a. class.
    b. kingdom.
    c. phylum.
    d. order.
    e. all of the above

20. At what temperature is water at its densest?
    a. 0°C
    b. 32°C
    c. 212°C
    d. 4°C
    e. 100°C

BIO 1130 An Introduction to Organismal biology
Midterm examination
Worth either 15% or 20% of your final grade
Total points for both parts of the exam is 62 pts

Saturday, October 2, 2010

Part B: Written questions

a) Place your name and student number in the space provided below. Be sure that your student number is on the top of each of the following pages – the exam will be separated. ONLY place your student number on the pages where indicated

b) Answer all questions in the space provided on the exam. Do not transfer answers to the back of the page.

c) You may use either pencil of ink for your answers.

d) Answers as written paragraphs are preferred but point form is acceptable as long as the points are logically organized and not random statements or facts

e) This is not an open book exam.

f) There are five pages including this one in part B of the exam, be sure you have all five pages.

g) Enter the multiple choice exam code in the space provided

Name: _____

Student number: _____

Multiple Choice Exam Code: _____

•

12 pts Part 1. Briefly explain what each of the following terms means or the biological contribution made by the person. Where possible include an example in your explanation from a group or an organism to which the term or name applies.

Vitalists

Proximate cause

Leclerc

Hypothesis

16 pts Part 2: Fill in the missing word, or provide the one word answer in the space provided at the end of the sentence. If the line is missing, add it to the end of the line.

2.1 Pasteur discredits this form of generation for how living things first appear. _____

2.2 This element is produced by dying red suns. _____

2.3 Natural sciences and physical scientists both agree that the objects that they study are subject to the laws of this discipline and those of physics. _____

2.4 The age of science starts with the scientific revolution. _____

2.5 Protocells that have been made to date lack this one characteristic of life. _____

2.6 Biology is first described as a science in this century; it marks the start of a better understanding of the living world. _____

2.7 Short nucleotide and protein sequences share this property when they are placed in aqueous solutions. _____

2.8 This gas wasn't present in earth's first atmosphere, its absence was why the early atmosphere was reducing. _____

2.9 Greeks such as Plato and Aristotle all believed that organisms were unique and unaltered types, a philosophy given this name. _____

2.10 With about twenty different building blocks it was long thought that this biopolymer was the genetic material. _____

2.11 Organisms that lived in the past but are no longer living on earth are said to be this. _____

2.12 This type of literature is written by the investigators that did the work and been reviewed by their colleagues in the field for accuracy. _____

2.13 Douglas Adams divides the history of modern science into four ages what was the principle investigative tool of his second age of sand. _____

2.14 In addition to making enough measurement you should also do this with your experiment to be sure you consistently reach the same conclusion. _____

2.15 The validity of historical narrative was ignored as a result of the scientific revolution until the mid 1800's. This scientist revalidated the narrative as a true and sound scientific method. _____

2.16 Number of Kingdoms in Linnaeus' classification. _____

2.17 This third eon in the geological time scale - single celled eukaryotes dominated the worlds oceans at the time. _____

2.18 Most of the earth's gaseous atmosphere probably resulted from its release from the cooling molten core. The process was called this. _____

Part three of the exam is on the next page

10 pts Part 3: Answer the following two questions in the space provided.

Describe the role of a theory and its falsification in investigations in Natural Sciences in the early 20th century

How does the Proteins first Hypothesis explain the origins of the Central Dogma in Biology; what is the Central Dogma?