BIO 1130FF

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

Saturday, October 13, 2012

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

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.

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.

Do not place any answers on the question sheet.

This is not an open book exam.

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

FF.1 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. the incomplete nature of the fossil record
c. lack of observational and experimental data

FF.2 At what temperature is water at its densest?
a. 0°C
b. 32°C
c. 212°C
d. 4°C
e. 100°C

FF.3 The Black Plague caused the end of
a. The late middle ages
b. The renaissance
c. The early middle ages
d. The high middle ages

FF.4 This important building block has not been successfully synthesized in experiments looking at the prebiotic organic chemistry of life's origins.
a. Transfer RNA
b. Nucelotides with the base and phosphate sugar components
c. Ribose
d. Amino acids

FF.5 The first classification of plants created during the Greek and Roman ages divided the plants into groups based on:
a: Seed morphology
b: The shapes of the leaves of the plant
c: Their flowers
d: The reproductive structures of the plant.

FF.6 Unlike Lamarckian evolution Darwn's evolutionary scheme was
a. a linear pattern
b. a cladistic pattern
c. a branching pattern
d. an essentialism pattern

FF.7 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

FF.8 Water's high specific heat is mainly a consequence of the
a. inability of water to dissipate heat into dry air.
b. absorption and release of heat when hydrogen bonds break and form.
c. fact that water is a poor heat conductor.
d. high specific heat of oxygen and hydrogen atoms.
e. small size of the water molecules.

FF.9 Which of the following pairs of traits are homologous?
a. butterfly wings and bat wings
b. the bones of bird and bat wings
c. the surface areas of bird and bat wings
d. butterfly wings and bird wings

FF.10 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.

FF.11 Our sun is an out of control nuclear fusion reactor that is converting hydrogen into what element
a. Carbon
b. Helium
c. Carbon
d. Nitrogen

FF.12 Who was responsible for establishing the classification system that uses binomial nomenclature?
a. Carolus Linnaeus
b. Louis Pasteur
c. Jean-Baptiste Lamarck
d. Charles Darwin

FF.13 The date October 23, 4004 BCE was important because:
a. it established the date for the creation of all the organisms on the planet.
b. it established the date of the great flood that was used by Cuvier to explain fossil animals.
c. It established a date for the origins of the scala naturae.
d. A and C are both correct
e. A and B are both correct

FF.14 Which of the following has the highest Darwinian fitness?
a. A scientist who devotes herself to science and wins the Nobel Prize
b. A woman who home schools her two children
c. A sperm donor who anonymously fathers 52 children
d. A personal trainer who works out at the gym every day

FF.15 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.

FF.16 Gill pouches in chick, human, and house-cat embryos are an example of
a. genetic homology.
b. embryological homology.
c. the inheritance of acquired characters.
d. structural homology.

FF.17 When this naturalist noticed that similar environments in different locations around the world didn't have the same types of plants and animals it marked the start of which biological science.
a. Biogeography
b. Ecology
c. Population Genetics
d. Essentialism
e. Taxonomy

FF.18 The Irish elk and the mammoth are two of the 23 large animals that George Cuvier found as used as evidence for this process.
a. Spontaneous generation
b. Scala naturae
c. Extinction
d. Transmutation of species
e. Transition fossils

FF.19 A controlled experiment is one in which
a. the experiment is repeated many times to ensure that the results are accurate.
b. the experiment proceeds at a slow pace to guarantee that the scientist can carefully observe all reactions and process all experimental data.
c. there are at least two groups, one of which does not receive the experimental treatment.
d. there is one group for which the scientist controls all variables.
e. there are at least two groups, one differing from the other by two or more variables.

FF.20 Which type of bond must be broken for water to vaporize?
a. hydrogen bonds
b. polar covalent bonds
c. ionic bonds
d. nonpolar covalent bonds
e. covalent bonds

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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 (MM or FF): _____

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12 pts Part 1. Briefly explain what each of the following terms or phrases 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.

LUCA

Vitalist

Transmutation of Species

How questions in science

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

2.2 The term a biologist uses when something is more than the sum of the parts. _____

2.3 Naturalist thinking begins with this group of philosophers in 400 BCE. _____

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

2.5 Natural scientists have to deal with this characteristic of the objects that they study, the physical scientists don't have the problem. _____

2.6 These protein building blocks were found in mater produced by the Miller-Urey experiment (two words). _____

2.7 Both a theory and a hypothesis must be able to withstand this. _____

2.8 Marine invertebrates are the main multicellular life form in this geological era. _____

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

2.10 All jelly fish have unique stinging cells called cnidocytes. The unknown specimen under the microscope has those cnidocytes so it is a jellyfish. This is an example of what type of thinking or reasoning. _____

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

2.12 The glass in fiber optic cables and the speed with which communication and data maybe shared led Douglas Adams' to use it as the hallmark for this age of sand that he proposed to divide up the modern age of science. _____

2.13. Type of cause that molecular biologists is working with when comparing the frequency of DNA sequence of a gene that causes a genetic disease in an isolated population of immigrants on a small south pacific island to the country that they arrived from. _____

2.14 Of hypothesis and theory this is the more general finding that has the broadest application. _____

2.15 Your text book is an example of this type of scientific literature. _____

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

2.17 Most of the earth's gaseous atmosphere probably resulted for its release from the cooling molten core; the process is called this. _____

2.18 Physical sciences deal with this type of material, biologists don't and it is one of the reasons that natural sciences were not a part of the scientific revolution. _____

Part three of the exam is on the next page

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

3.1 What are transitional forms and which of Darwin's theories do they provide evidence for, give an example?

3.2 While there are a number of plausible hypotheses for most of the steps in chemical and biological evolution of the first cells there is some uncertainty on how the first macromolecules polymerized. Explain this uncertainty.