BIO 1130FF

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

Saturday, October 5, 2013

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 A trait that varies in a continuum, with incremental changes between individuals, is termed _____.
a. polymorphism
b. qualitative variation
c. quantitative variation
d. phenotypic variation

FF.3 Which of the following statements is not a possible mechanism for evolution as proposed by Jean Baptiste de Lamarck?
a. Body parts grow in proportion to how much they are used, while unused body parts shrink.
b. Changes acquired in an organism's lifetime are passed on to its offspring.
c. Only the fittest organisms survive.
d. A metaphysical "perfecting principle" caused organisms to become better suited to their environments.

FF.4 Which of the following statements about of the evolution of horses is false?
a. The evolution of the horse is characterized by a general pattern of increasing size across species.
b. Early equine ancestors were browsers, not grazers.
d. As the evolution of the horse progressed there was a reduction of number of toes in some lineages.
e. As the evolution of the horse progressed there was an increase on the size of their molars to better grind up the grasses they ate.

FF.5 Null hypothesis predicts what scientists would see if _____.
a. their hypothesis was true
b. a factor had no effect
c. the factor under investigation was responsible for the effect
d. the trait under investigation was not heritable

FF.6 Which scientist independently developed a theory nearly identical to Charles Darwin's on the mechanism for evolution of species?
a. Aristotle
b. Carolus Linnaeus
c Jean Baptiste de Lamarck
d. Alfred Russell Wallace

FF.7 The wings of birds, the legs of pigs, and the flippers of whales provide an example of:
a. vestigial structures.
b. homologous structures.
c. acquired characteristics.
d. artificial selection.
e. uniformitarianism.

FF.8 Which process results in microevolution without any form of natural selection?
a. development of new characteristics during an individual's lifetime
b. mutation
c. genetic drift
d. genetic variation
e. none

FF.9 The Hardy-Weinberg principle specifies the conditions under which _____.
a. a population will evolve
b. a population will not evolve
c. dominant alleles inevitably replace recessive ones
d. an individual diploid organism will evolve

FF.10 The concept of uniformitarianism _____.
a. was proposed by James Hutton
b. states that the gradual processes that formed the Earth continue to occur in the present time
c. implies that the Earth must be thousands of years old
d. does not apply to biological evolution

FF.11 Georges Curvier, a founder of paleobiology, suggested that abrupt changes in rock layers and the fossils they contained represent _____.
a. layers from periods of great colonization of new species
b. layers of gradual steady accumulation of sediments and dead organisms
c. layers deposited when many organisms died in local catastrophes
d. layers of descendants of species found in deeper layers

FF.12 The Muslim scholar Al-Baitar is best known for his biological work on:
a. A list of plants with descriptions of each plant's life cycle
b. A list of plants that included a pharmaceutical index of their importance - it was in use until the late 18th century
c. His book the canon of medicine that integrated the works of Greek, Indian and Muslim physicians
d. Introduction of the scientific method

FF.13 Which of the following kinds of traits was originally used for classifying organisms into taxonomic categories?
a. DNA and amino acid sequences
b. geography and ecology
c. morphology
d. physiology and biochemical pathways

FF.14. Darwin used the term “artificial selection” to refer to _____.
a. selective breeding by humans to create new varieties of agricultural crops, farm animals, and pets
b. the creation of new species in a laboratory test tube
c. the crossing of different species to produce new hybrid species
d. all of the choices

FF.15 Which of the following statements is true about allopolyploidy?
a. Two closely related species hybridize and subsequently form polyploid offspring.
b. The total geographic separation of two populations is required.
c. All offspring produced are sterile.
d. The hybrid’s chromosome number is reduced.

FF.16 The evolutionary history of a species or higher taxon is called its:
a. Phenetics.
b. Phylogeny.
c. Convergence.
d. Taxonomy.

FF.17 A recessive allele may be maintained within a larger population because of
a. diploidy.
b. gene flow.
c. sexual selection.
d. genetic drift.

FF.18 As the frequency of a recessive allele declines, it is more likely to be _____.
a. found in a homozygous recessive genotype
b. found in a heterozygous genotype
c. eliminated from the population
d. advantageous to remaining individuals carrying it

FF.19 In a population at genetic equilibrium for a particular locus, the frequency of the heterozygous genotype is represented by _____.
a. p2
b. pq
c. 2pq
d. q2

FF.20 Why don't spontaneous mutations have an immediate effect on allele frequencies in large populations?
a. Mutations are random events, and mutations may be either beneficial or harmful.
b. Most mutations do not change the amino acid sequence of a protein.
c. Many mutations exert their effects after an organism has stopped reproducing.
d. Mutations are so rare that mutated alleles are greatly outnumbered by non mutated alleles.

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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.

2nd age of sand

Proximate cause

Stabilizing selection

Folk taxonomy

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 Historical narratives ask this type of question. _____

2.2 Type of mutation when the gene sequence along a chromosome changes from abcdefg to abefg. _____

2.3 Genus and species names are written in this language. _____

2.4 Early colonists that settled the new world are often an example of this type of genetic drift (Two words). _____

2.5 This type of trait masks and hides another. _____

2.6 Under normal circumstances the range of variation for a phenotype can be represented with this type of curve. _____

2.7 This disease, transmitted by fleas, killed as almost half the population of Europe in (Two words) _____

2.8 The evolutionary history of a group of organisms is expressed as this. _____

2.9 Evolutionary change that results from changes in allele frequencies. _____

2.10 Taxon below a phylum but above an order. _____

2.11 Until the start of the 19th century people that studied the living world were commonly referred to as this type of investigator or scientist. _____

2.12 While there are lots of different Laws associated with the physical science, laws are not often found in the natural science because of this characteristic of a scientific law. _____

2.13 The name of the 19th century scientist who becomes the father of physiology because of his extensive studies on this system. _____

2.14 Special typographic formatting that you have to apply to a genus species name when typed.

2.15 Plural of taxon. _____

2.16 The presence of variation that is based on a genetic program distinguishes this type of science. _____

2.17 This type of literature is written by the investigators that work in the field but is a review of a special topic and then reviewed by their colleagues in the same field for accuracy.

_____

2.18 The Greek philosopher Aristotle primarily studied this group of organisms.

_____

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 is Darwin's theory on "no constancy of species"? In your answer provide two observations/examples that support the theory.

3.2 What is gene fixation and how does it come about; what are the consequences for a population that experiences it?

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