

BIO 1130FF

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

Saturday, October 4, 2014

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

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Multiple choice questions - Place your answers on the answer sheet

FF.1 Which of these evolutionary agents is most consistent at causing populations to become better suited to their environments over the course of generations?

- a. Mutation
- b. Natural selection
- c. Non-random mating
- d. Gene flow
- e. Genetic drift

FF.2 The fossil *Archeopteryx* is an important transitional fossil because it demonstrates which of the following environmental transitions.

- a. Marine to terrestrial
- b. Freshwater to terrestrial
- c. Terrestrial to freshwater
- d. Terrestrial to air
- e. Terrestrial to marine

FF.3 Which of the following statements best summarizes evolution as it is viewed today?

- a. It is the descent of humans from the present-day great apes.
- b. It is synonymous with the process of gene flow.
- c. It represents the result of selection for acquired characteristics.
- d. It is the differential survival and reproduction of the most-fit phenotypes.
- e. It is goal-directed.

FF.4 Four of the five processes below are components of natural selection. Select the EXCEPTION.

- a. genetic drift
- b. genetic variation
- c. limitations in vital resources
- d. differential reproductive success
- e. overproduction of offspring

FF.5 Which of the following ideas, important to the development of evolutionary theory, was suggested by Charles Lyell?

- a. The earth is at least millions, not thousands, of years old.
- b. Species produce many more offspring than can survive.
- c. Organisms can be classified into groups based on their morphological characteristics.
- d. Food and other resources are limited for most populations.

FF.6 If the diploid number of chromosomes of a plant species is 32, how many chromosomes would one expect to find in an autopoloid gamete produced by that plant?

- a. 0
- b. 16
- c. 32
- d. 64

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FF.7 The scientific discipline concerned with naming organisms is called

- a. phylocode
- X b. taxonomy.**
- c. cladistics.
- d. systematics.
- e. binomial nomenclature

FF.8 Directional selection favours

- a. intermediate phenotypes.
- b. phenotypic extremes at both ends.
- X c. phenotypes at one end of the distribution.**
- d. homozygotes.
- e. heterozygotes.

FF.9 Charles Darwin made his most important observations that later led him to develop the theory of evolution _____.

- a. as a student studying at Cambridge University
- b. as a young naturalist working in the Asian tropics
- X c. on a voyage on the surveying ship Beagle that sailed around the world**
- d. after viewing collections of specimens at various museums in Europe

FF.10 Molecular phylogenies are constructed with data from sequences of

- a. DNA and RNA.
- b. proteins.
- c. amino acids.
- X d. a and b.**

FF.11 Early scientists studying biogeography noticed that _____.

- a. there is a limited, easily documented number of species found in similar habitats around the world
- X b. different species with similar forms occupy similar habitats on different continents**
- c. identical species occupy similar habitats around the world
- d. most species are widely distributed around the world

FF.12 When Darwin visited the Galápagos Islands, he discovered that tortoise and finch species on different islands are _____.

- a. identical, but completely unrelated to those on the mainland
- b. unrelated
- c. identical to each other, and related to those on the mainland
- X d. slightly different but closely related, and also related to those on the mainland**

FF.13 Sexual dimorphism is most often a result of

- X a. intersexual selection.**
- b. artificial selection.
- c. pansexual selection.
- d. intrasexual selection.
- e. stabilizing selection.

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- FF.14 Each of the following has a better chance of influencing gene frequencies in small populations than in large populations, but which one most consistently requires a small population as a precondition for its occurrence?
- a. Mutation
 - b. Natural selection
 - c. Non-random mating
 - d. Genetic drift
 - e. Gene flow
- FF.15 Darwin changed the way we think about variation and its influence on biodiversity by natural selection. This new type of thinking was termed:
- a. essentialist thinking
 - b. finalist thinking
 - c. population thinking
 - d. transformation thinking
- FF.16 Which of the following could be an example of allopolyploidy?
- a. One parent has 32 chromosomes, the other has 10, and their offspring have 42.
 - b. Gametes and somatic cells have the same number of chromosomes.
 - c. Chromosome number increases by one in a gamete and in the offspring it produces.
 - d. Chromosome number in the offspring is exactly half of what it is in the parents.
- FF.17 Which of these theories did Georges Cuvier hold to be true, with regards to species change?
- a. gradualism
 - b. catastrophism (catastrophy theory)
 - c. evolution
 - d. geological time
- FF.18 Darwin's theory of evolution was unique for all of the following reasons except _____.
- a. Darwin provided physical rather than spiritual explanations for the origins of biological diversity
 - b. Darwin provided a mechanism by which individuals could adapt as their environment changed
 - c. Darwin described evolution as a multistage process
 - d. Darwin understood that evolution occurs because some organisms function better than others in a particular environment
- FF.19 Which of the following conditions is not one of those under which a population of diploid organisms will achieve genetic equilibrium?
- a. the mutation rate is increasing
 - b. no immigration from other populations
 - c. the population is infinite in size
 - d. individuals mate randomly
- FF.20 A population of mice is at Hardy-Weinberg equilibrium at a gene locus that controls fur colour. The locus has two alleles, M and m. A genetic analysis of the population reveals that 60% of its gametes carry the M allele. What percentage of mice contain both the M and m alleles?
- a. 16%
 - b. 36%
 - c. 48%
 - d. 64%