

# BIO 1130MM

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 BIO1130MM 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 **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 13, 2012  
Multiple choice questions - Place your answers on the answer sheet

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MM.1 The founder effect is a type of

- a. gene flow.
- b. mutation.
- c. adaptation.
- X** d. genetic drift.
- e. natural selection.

MM.2. Which of the following ideas proposed by Lamarck was NOT included in Darwin's theory?

- a. Organisms change in response to their environments.
- X** b. Changes that an organism acquires during its lifetime are passed to its offspring.
- c. All species change with time.
- d. Changes are passed from one generation to the next.

MM.3. The concept of uniformitarianism \_\_\_\_\_.

- a. was proposed by James Hutton
- X** b. states that the 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

MM.4 Variation is not preserved by \_\_\_\_\_.

- a. diploidy
- b. heterozygote advantage
- c. varying environments
- X** d. inbreeding

MM.5 The number of major taxonomic categories in the present classification system.

- a. Five
- b. Four
- X** c. Seven
- d. Six
- X** e. Eight

MM.6 The Dunkers are a religious group that moved from Germany to Pennsylvania in the mid-1700s.

They do not marry with members outside their own immediate community. Today, the Dunkers are genetically unique and differ in gene frequencies, at many loci, from all other populations including those in their original homeland. Which of the following likely explains the genetic uniqueness of this population?

- a. Population bottleneck and Hardy-Weinberg equilibrium
- X** b. Founder effect and genetic drift
- c. Heterozygote advantage and stabilizing selection
- d. Mutation and natural selection
- e. Sexual selection and inbreeding depression

BIO 1130MM - Midterm Examination – October 13, 2012  
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- MM.7 Fossil evidence indicates that horses have gradually increased in size over geologic time. Which of the following terms best describes this?
- a. sexual selection
  - b. stabilizing selection
  - c. disruptive selection
  - d. artificial selection
  - X e. directional selection**
- MM.8 Which of the following agents of microevolutionary change is most likely to cause the greatest effect on genetic variation in the least amount of time?
- a. mutation
  - b. genetic drift
  - X c. gene flow**
  - d. nonrandom mating
- MM.9 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.
  - X c. Only the fittest organisms survive.**
  - d. A metaphysical "perfecting principle" caused organisms to become better suited to their environments.
- MM.10 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.
  - X d. Mutations are so rare that mutated alleles are greatly outnumbered by non mutated alleles.**
- MM.11 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
- MM.12 Which of the following statements is true about allopolyploidy?
- X 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.
- MM.13 Mutations that confer no apparent selective advantage or disadvantage in a particular environment are said to be selectively
- a. deleterious.
  - b. stabilizing.
  - c. benign.
  - d. random.
  - X e. neutral.**

BIO 1130MM - Midterm Examination – October 13, 2012  
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- MM.14 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
- MM.15 Darwin represented his idea that all species arose through “Common ancestry” by a \_\_\_\_.
- a. chain, representing the linking of all species
  - b. ladder, representing the increase in complexity of organisms farther up the ladder
  - c. tree, showing the branching of species from each other
  - d. net, showing multiple relationships among organisms
- MM.16 Charles Darwin’s eventual role on the Beagle was to \_\_\_\_\_.
- a. assist the ship in its surveying mission
  - b. develop the theory of evolution
  - c. collect evidence to support the theory of evolution
  - d. serve as a naturalist
- MM.17 Why was Darwin and Wallace's theory of evolution by natural selection revolutionary?
- a. It proved that individuals acclimated to their environment over time.
  - b. It was the first time a biologist had proposed that species changed through time.
  - c. It implied that England's economy would improve if the monarchy were eliminated.
  - d. It dismissed the idea that species are constant and emphasized the importance of variation and change in populations.
- MM.18 The fossil Archaeopteryx \_\_\_\_.
- a. shows an intermediate structure between birds and dinosaurs
  - b. proves that birds could not have evolved from dinosaurs
  - c. proves that birds evolved from dinosaurs
  - d. was proved to be a fake
- MM.19 Which scientist is considered to be the first student of natural history, the study of the variety of organisms and their form?
- a. Aristotle
  - b. Carolus Linnaeus
  - c. Galileo Galilei
  - d. Charles Darwin
- MM.20 When applying the process of science, which of these is tested?
- a. a result
  - b. an observation
  - c. a hypothesis
  - d. a question