

BIO 1130FF

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

Saturday, November 13, 2010

Part A: Multiple choice questions
30 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**
- f) **You do not need a calculator for this exam**

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

BIO 1130FF - Midterm Examination – November 13, 2010
Multiple choice questions - Place your answers on the answer sheet

- 1.1A lophophore is used by bryozoans
- For locomotion
 - In the larval stage of the life cycle
 - For feeding**
 - For sensory perception
 - As a skeletal system
- 1.2 Which of the following is not a feature of the tube-within-a-tube body plan in most animals?
- Typically, the outer tube consists of a hard exoskeleton.**
 - The inner tube consists of digestive organs.
 - Typically, the mouth and anus form the ends of the inner tube.
 - The two "tubes" are separated by mesoderm tissue.
- 1.3 Which of the following traits do archaeans and bacteria share?
- composition of the cell wall
 - presence of plasma membrane
 - lack of a nuclear envelope
 - identical rRNA sequences
- 2 and 4
 - 3 only
 - 2 and 3**
 - 1 and 3
 - 1 only
- 1.4 According to the endosymbiotic theory, why was it adaptive for the larger (host) cell to keep the engulfed cell alive, rather than digesting it as food?
- The host cell was able to survive anaerobic conditions with the engulfed cell alive.
 - The engulfed cell provided the host cell with ATP.**
 - The engulfed cell provided the host cell with carbon dioxide.
 - The engulfed cell allowed the host cell to metabolize glucose.
 - The host cell would have been poisoned if it had digested the engulfed cell.
- 1.5 An organism that obtains its carbon from CO₂ is a(n)
- chemotroph.
 - autotroph.**
 - heterotroph.
 - auxotroph.
- 1.6 Four of the five processes below are components of natural selection. Select the EXCEPTION.
- genetic drift**
 - genetic variation
 - limitations in vital resources
 - differential reproductive success
 - overproduction of offspring

BIO 1130FF - Midterm Examination – November 13, 2010
Multiple choice questions - Place your answers on the answer sheet

- 1.7 In a Hardy-Weinberg population with two alleles, A and a, that are in equilibrium, the frequency of the allele a is 0.4. What is the percentage of the population that is homozygous for this allele?
- a. 4
 - b. 36
 - c. 40
 - d. 16
 - e. 32
- 1.8 In bacterial transformation, cells
- a. make replicate copies of one another.
 - b. take up pieces of DNA that are released as other cells disintegrate.
 - c. take up pieces of DNA through infection of a virus.
 - d. replicate DNA molecules.
- 1.9 In terms of food capture, which sponge cell is most similar to the cnidocyte of a Cnidarian?
- a. choanocyte
 - b. epidermal cell
 - c. gamete
 - d. zygote
 - e. pore cell
- 1.10 What is the major goal of cellular respiration?
- a. supply cell with fixed carbon
 - b. generate O₂
 - c. produce ATP
 - d. reduce an electron acceptor molecule
 - e. All of the above answers apply.
- 1.11 Which free-living cells were the earliest contributors to the formation of Earth's oxidizing atmosphere?
- a. endosymbionts
 - b. mitochondria
 - c. seaweeds
 - d. cyanobacteria
 - e. chloroplasts
- 1.12 Which is one of the main energy transformers of cells?
- a. Golgi apparatus
 - b. lysosome
 - c. peroxisome
 - d. vacuole
 - e. mitochondrion

BIO 1130FF - Midterm Examination – November 13, 2010
Multiple choice questions - Place your answers on the answer sheet

- 1.13 Members of the Mollusc class ____ have a pair of shells that are hinged together.
- a. Polyplacophora
 - b. Cephalopoda
 - c. Bivalvia
 - d. Scaphopoda
- 1.14 Which structure is the site of the synthesis of proteins that may be exported from the cell?
- a. rough ER
 - b. Golgi vesicles
 - c. lysosomes
 - d. tight junctions
 - e. plasmodesmata
- 1.15 Prokaryotes were split into two domains based on differences in
- a. cell wall composition.
 - b. cell membrane properties.
 - c. rRNA sequences.
 - d. staining characteristics.
- 1.16 Protostomes with a unique layer of tissue called the mantle that may secrete a shell are part of which phylum?
- a. Mollusca
 - b. Arthropoda
 - c. Annelida
 - d. Cnidaria
 - e. Echinodermata
- 1.17 Secondary endosymbiosis occurs when a
- a. non-photosynthetic eukaryote engulfs a photosynthetic prokaryote.
 - b. photosynthetic eukaryote engulfs a photosynthetic prokaryote.
 - c. photosynthetic eukaryote engulfs a non-photosynthetic prokaryote.
 - d. non-photosynthetic eukaryote engulfs a photosynthetic eukaryote.
- 1.18 The blastopore denotes the presence of an endoderm-lined cavity in the developing embryo, a cavity that is known as the
- a. archenteron.
 - b. germ layer.
 - c. blastocoel.
 - d. blastula.
 - e. coelom.
- 1.19 The genome of prokaryotes consists of
- a. many linear DNA molecules.
 - b. multiple circular DNA molecules.
 - c. a single DNA molecule that may be circular or linear, depending on the species.
 - d. a single linear DNA molecule.

BIO 1130FF - Midterm Examination – November 13, 2010
Multiple choice questions - Place your answers on the answer sheet

- 1.20 The muscles of the body wall are derived mainly from which embryonic cell layer in most metazoans?
- a. mesoderm
 - b. ectoderm
 - c. mesoglea
 - d. endoderm
- 1.21 The only survivors of a colony on Venus are a man and a woman, who happen to be both originally from southern Ukraine. Their descendants will show the effect of
- a. excessive mutation.
 - b. punctuated equilibrium.
 - c. heterozygote advantage.
 - d. genetic drift.
 - e. frequency-dependent selection.
- 1.22 The protists are a diverse group of organisms that have traditionally been grouped together because they all
- a. are not prokaryotes, fungi, plants, or animals.
 - b. have very similar DNA sequences.
 - c. have very similar shapes.
 - d. have the same type of nutrition.
- 1.23 The three domains of life are
- a. Archaeobacteria, Eubacteria, and Eukaryota.
 - b. Prokaryota, Eukaryota, and Protoctista.
 - c. Archaea, Bacteria, and Eukarya.
 - d. animals, plants, and microorganisms.
- 1.24 The width of a DNA double helix
- a. is narrower where adenine is present than where cytosine is present.
 - b. is wider where purines are present than where pyrimidines are present.
 - c. varies randomly.
 - d. is constant.
- 1.25 Which of the following adds individual nucleotides to the 3' end of an existing strand to build a new DNA strand during DNA replication?
- a. helicase
 - b. topoisomerase
 - c. DNA polymerase
 - d. primase
- 1.26 Which of the following describe(s) echinoderms?
- a. They have an endoskeleton of hard calcareous plates.
 - b. Tube feet provide motility in most species.
 - c. They have a pseudocoelom.
 - d. They have an endoskeleton of hard calcareous plates, and tube feet provide motility in most species.
 - e. They have an endoskeleton of hard calcareous plates, tube feet provide motility in most species, and they have a pseudocoelom.

- 1.27 Which of the following includes the cyanobacteria?
- a. photoheterotroph
 - b. photoautotroph
 - c. chemoheterotroph
 - d. chemoautotroph and photoheterotroph
- 1.28 Which of these is the smallest unit upon which natural selection directly acts?
- a. a population's gene frequency
 - b. an individual's genome
 - c. an individual's genotype
 - d. an individual's phenotype
 - e. a species' gene frequency
- 1.29 Cattle breeders have improved the quality of meat over the years by which process?
- a. artificial selection
 - b. directional selection
 - c. stabilizing selection
 - d. artificial selection and directional selection
 - e. artificial selection and stabilizing selection
- 1.30 Cephalization is primarily associated with
- a. method of reproduction.
 - b. fate of the blastopore.
 - c. adaptation to dark environments.
 - d. type of digestive system.
 - e. bilateral symmetry.