BIO 1130MM

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

Saturday, November 8, 2014

Part A: Multiple choice questions
26 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

MM.1 Bacteria and Archaea are most easily distinguished from each other by their:
a. reproduction method.
b. chromosome structure.
X c. transcription and translation mechanism.
d. habitat.

MM.2 Water's high specific heat is mainly a consequence of the
a. inability of water to dissipate heat into dry air.
X 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.

MM.3 You are studying lizards in the field. The range of the northern population, species 1, overlaps the range of the southern population, species 2. You find hybrids in the zone of overlap. What is happening?
a. The postzygotic isolating mechanisms aren't working.
b. Hybrids are best adapted to this region where overlap occurs.
c. Reinforcement is occurring.
X d. There is not enough information to decide what is happening.

MM.4 Many anti-retroviral drugs that target retroviruses such as HIV attack the enzyme _____.
a. DNA polymerase
b. RNA polymerase
X c. reverse transcriptase
d. helicase

MM.5 The presence of cytoplasmic organelles is characteristic of
a. Bacteria only.
b. Archaea only.
X c. neither Archaea nor Bacteria.
d. both Archaea and Bacteria.

MM.6 The process by which bacterial genes from one bacterium are transferred to another via a virus is called _____.
a. translation
X b. transformation
c. transduction
d. transcription

MM.7 The biological species concept is inadequate for grouping
X a. asexual organisms.
b. animals that migrate.
c. plants.
d. sympatric populations.
e. parasites.

MM.8 What is a hybrid zone?
a. an area where two populations may breed and produce inviable, fertile offspring
b. an area where no hybrids exist
c. an area where two populations may breed and produce inviable, infertile offspring
X d. an area where two populations may breed and produce viable, fertile offspring

MM.9 The three domains of life are
a. Archaebacteria, Eubacteria, and Eukaryota.
b. Prokaryota, Eukaryota, and Protoctista.
X c. Archaea, Bacteria, and Eukarya.
d. animals, plants, and microorganisms.

MM.10 The first genes on Earth were probably
a. RNA produced by autocatalytic, proteinaceous enzymes.
X b. auto-catalytic RNA molecules.
c. oligopeptides located within protocells.
d. DNA molecules whose information was transcribed to RNA and later translated in polypeptides.
e. DNA produced by reverse transcriptase from abiotically produced RNA.

MM.11 Bacterial flagella are differentiated from pili by the fact that flagella _____.
a. are usually shorter than pili
b. function in adhesion but pili function in locomotion
c. move in a whiplike motion while pili rotate
X d. rotate to move the cell while pili are rigid extensions for adhesion

MM.12 A ____ is an extension of a lobe of the cytoplasm, which is used by some protists for movement.
X a. pseudopod
b. gullet
c. pilus
d. cilium

MM.13 An example of the phylogenic species concept would be achieved by
a. doing a genetic analysis on the two organisms.
b. mating the two organisms to see if viable offspring result.
X c. tracing the common ancestry of the two organisms.
d. looking at the appearance of two organisms.

MM.14 Small circles of DNA that occur in bacteria in addition to the main circular chromosomal DNA molecule are called
a. transformants.
b. plastids.
X c. plasmids.
d. plasmitrons.

MM.15 The purple non-sulfur bacterium ***Rhodospirillum*** grows best as a photoheterotroph. What are the most favorable sources of energy and carbon for this bacterium?
a. glucose
b. light and CO_2
X c. fructose and light
d. methane and CO_2

MM.16 Natural selection might promote the evolution of prezygotic isolating mechanisms between two similar species in a hybrid zone _____.
a. if hybrid offspring have high relative fitness
b. when hybrid offspring are significantly larger
X c. if hybrid offspring have low relative fitness
d. when the two similar species are both ring species

MM.17 Where did the first oxygen come from?
a. fermentation
b. anaerobic respiration
c. aerobic respiration
X d. oxidizing water

MM.18 Which eons had atmospheric oxygen present for the entire eon?
a. Hadean
b. Archean and Proterozoic
c. Proterozoic
d. Phanerozoic
X e. Proteozoic and Phanerozoic

MM.19 Which of the following describe all existing bacteria?
a. small, harmful, fast-growing
X b. tiny, ubiquitous, metabolically diverse
c. pathogenic, omnipresent, morphologically diverse
d. extremophiles, tiny, abundant
e. all of the above

MM.20 Biologists sometimes divide living organisms into two groups: autotrophs and heterotrophs. How do these two groups differ?
X a. They use different sources of carbon.
b. They use different sources of energy.
c. They use different electron acceptors.
d. They differ in the way they generate ATP.

MM.21 Which of these is the most common compound in the cell walls of gram-positive bacteria?
a. lignin
b. protein
c. lipopolysaccharide
X d. peptidoglycan
e. cellulose

MM.22 Why does ice float in liquid water?
a. Ice always has air bubbles that keep it afloat.
X b. Hydrogen bonds stabilize and keep the molecules of ice farther apart than the water molecules of liquid water.
c. The crystalline lattice of ice causes it to be denser than liquid water.
d. The ionic bonds between the molecules in ice prevent the ice from sinking.
e. The liquid water molecules have more kinetic energy and thus support the ice.

MM.23 Protobionts (protocells) are
a. a group of abiotically produced inorganic molecules surrounded by a membrane-like structure.
X b. a group of abiotically produced organic molecules surrounded by a membrane-like structure.
c. a group of biotically produced inorganic molecules surrounded by a membrane-like structure.
d. a group of biotically produced organic molecules surrounded by a membrane-like structure.

MM.24 Ciliates have a micronucleus that functions primarily to _____.
X a. regulate sexual and asexual reproduction
b. regulate housekeeping functions
c. encode cell-surface proteins that bind to host cell receptors
d. produce rRNA

MM.25 The term phytoplankton refers to a collection of small _____ protists that live in bodies of water.
a. multicellular
b. multinucleated
c. parasitic
X d. photosynthetic

MM.26 The contractile vacuole functions to _____.
a. store energy-rich molecules
b. propel the cell through water, mud, or bodily fluids
c. digest prey
X d. expel water that enters through osmosis