

BIO 1130 An Introduction to Organismal Biology
Midterm examination
Worth either 15% or 20% of your final grade
Total points for both parts of the exam is 80 pts

Saturday, November 12, 2016

Part B: Written questions

- a) Cellular phones, unauthorized electronic devices or course notes (unless an open-book exam) are not allowed during this exam. Phones and devices must be turned off and put away in your bag. Do not keep them in your possession, such as in your pockets. If caught with such a device or document, the following may occur: you may be asked to leave immediately the exam, academic fraud allegations will be filed which may result in you obtaining a 0 (zero) for the exam
- b) Place your name and student number in the space provided below. Be sure only your student number is on the top of each of the following pages – the exam will be separated and if your name is not on a page your mark will be zero for that page.
- c) 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 or 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) A calculator is not required for the exam
- g) There are five pages, including this one, in part B of the exam, be sure you have all five pages.
- h) Enter the multiple choice exam code in the space provided

Name: _____

Signature: _____

Student number: _____

Multiple Choice Exam Code (MM or FF): _____

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STUDENT NUMBER: _____

Don't enter your name.

12 pts Part 1. Briefly explain what each of the following terms 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.

Habitable zone

{zone in solar system where water is in a liquid form/all three forms} Position depends on {size and energy of the sun –temperature to keep water liquid, not too cold not too hot/Goldilocks} {size of the planet/gravity are important in retaining an atmosphere}

Chemoorganotroph

{Type of metabolism (in bacteria)} {Carbon source is carbon dioxide} {energy source/produce ATP comes from breaking organic Carbon-carbon bonds}

Gene fixation

{high selective pressure/not natural – human intervention} {for/against an allele/phenotype or trait} {results in that allele being the only one on the population/the other disappears}

Note: that gene is not an appropriate answer because genes are expressed as different alleles

Silent mutation

{point mutations/change in a single nucleotide} {in the third position of the codon} {doesn't cause an change in the amino acid used in the protein}

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30 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 This type of resistance is often coded in the bacterial plasmid. _____ **Antibiotic** _____

2.2 The type of viruses that attacks bacteria. ___ **Bacteriophage** _____

2.3 These membrane bound intracellular structures common in eukaryote cells are missing in bacteria. ___ **organelles** _____

2.4 One of the advantages of a nuclear envelope surrounding the nucleus is that replication and this stage in the central Dogma of Biology is restricted to the nucleus. ___ **Transcription** _____

2.5 When a non-photosynthetic cells engulfes an algal cell what term is used to describe this type of endosymbiosis. _____ **Secondary** _____

2.6 This element is produced by dying red suns and is found throughout the universe. _____ **Carbon** _____

2.7 The contents of this organelle contain the digestive enzymes that will fuse with the food vacuole in protozoans. _____ **Lysosome** _____

2.8 Organic chemistry is the study of the chemistry of this element. _____ **Carbon** _____

2.9 Mitochondria replicate using this bacterial process (Two words) _ **Binary fission** _____

2.10 This type of selection occurs if, because of an unfavourable trait, there is selection against one extreme of the natural variation in a population. _____ **Directional** _____

2.11 Two multicellular eukaryote Kingdoms are descendants of unikont cells; both Kingdoms have this nutritional strategy. _____ **Heterotrophic** _____

2.12 The extinction of dinosaurs marks the start of this era in Earth's history. ___ **Cenozoic** _____

2.13 Describes the cycles of multiple fission by the malarial parasite inside the human host. ___ **Shizogony** _____

2.14 The type of cell fission that creates two equal sized daughter cells. ___ **Binary/Mitosis** _____

- 2.15 One of the first things a virus entering host does is to destroy this material in the host. ___ **DNA/genome** ___
- 2.16 When comparing the complexity of RNA polymerase organisms in this domain have a simpler polymerase. ___ **Eubacteria / bacteria** ___
- 2.17 Polymerized proteins convert the endoplasm to this form during amoeboid movement. ___ **ectoplasm** ___
- 2.18 Bikonts are the ancestral cell to which of the multicellular eukaryote Kingdoms. _ **Plantae/plants** ___
- 2.19 This type of wave is used by a ciliate when the cilia beat on the surface of their body. ___ **Metachronal** ___
- 2.20 These lipids are found in protocells but not micelles. ___ **phospholipids** ___
- 2.21 From about 4,800 Ma to 3,800 Ma this eon saw the formation of our solar system and the planet earth. ___ **Hadean** ___
- 2.22 The domain of "extreme" bacteria. ___ **Archea** ___
- 2.23 Number of lipid layers in a micelle. ___ **One** ___
- 2.24 Unlike the organization of the genome in bacteria with only one replication point, the ___ **linear** ___ arrangement eukaryote chromosomes allows for multiple replication points.
- 2.25 This geological eon occurred from 3.8 Ma ago until 2,500 Ma and ends when oxygen first appears in the earth's atmosphere. ___ **Archean** ___
- 2.26 These molecular motors travel away from the structure that builds the microtubules. ___ **Kinesin** ___
- 2.27 This modified amino acid is always the first in a bacterial protein and its presence is one of the differences between the bacterial domain and the Archea and Eukarya. ___ **Formylmethione** ___
- 2.28 Whichever came first as the long macromolecule it had to have two characteristics: do this and have catalytic function. ___ **Replicate** ___

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2.29 This type of genetic drift occurs when a population is reduced to only a few

survivors that remain in their original habitat. ___ **Bottleneck** ___

2.30 This one carbon hydrocarbon gas was present in the earth's original

atmosphere. ___ **Methane** ___

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Don't enter your name.

12 pts Part 3: Answer the following two questions in the space provided. Each question is worth 6 points

3.1 Describe the structure of a bacterial flagellum and how it moves.

3 parts to the structure in the correct order {filament (not a flagellum)/the extends out of the cell} {attached to a bent hook} {hook is attached to the motor} How it moves: {shaft of the motor surrounded by rings embedded in membrane} {ATP/energy burned to produce proton gradient} {as protons move down the gradient through the protein motor the shape changes and pushes the shaft of the motor}

3.2 How do biologists believe the first organic compounds appeared in the ancient oceans to create the primordial soup?

{Miller-Ury experiment/prebiotic soup} {electrical discharges (lightning) produced them in the atmosphere of water vapour, methane and other gases}

{Hydrothermal vents} {deepest parts of the oceans where under extreme pressure and heat and gasses from volcanic source produce organic materials}

{Interstellar organics} {the organic molecules were already formed and contained dissolved in the water when it arrived on the planet as it formed}

NOTE: This question has nothing to do with the origins of life - panspermia