

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 9, 2013

Part B: Written questions

- a) Place your name and student number in the space provided below. Be sure that your student number is on the top of each of the following pages – the exam will be separated. **ONLY** place your student number on the pages where indicated
- b) 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) There are five pages including this one in part B of the exam, be sure you have all five pages.
- g) Enter the multiple choice exam code in the space provided

Name: _____

Student number: _____

Multiple Choice Exam Code (MM or FF): _____

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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.

Outgroup

{cladistics/systematics analysis/used in building a cladogram} {Has all the primitive 0-state (plesiomorphic) traits} {roots/used to compare all the other species or taxa/also called a sister group in some cases} {out group examples used in the course include: the springtail for the insects, lamprey (agnatha) to the vertebrates, sponges (Porifera to the metazoan animals)}

Bacterial transformation

{Horizontal/Gene transfer mechanism/increased genetic variation} {External DNA/DNA outside the bacterial cell} {Is taken inside the cell and incorporated into the Bacterial DNA/genome}

Chemolithotrophic heterotroph

{Description of energy metabolism and/or building complex carbon molecules} {Heterotroph – get the carbon from existing organic carbon/C-C bonds} {Chemolitho – Mineral are used to generate the High energy electrons/protons/redox to produce ATP as an energy source}

http://salinella.bio.uottawa.ca/BIO1130/Lectures/default.php?1130_lectB02_Dvty_Arch_Meta.php??E?Md2ChapterMcp1

Diplontic life cycle

{Most of the life cycle is spent in the diploid state/mitotic divisions of the life cycle are in the diploid state} {Zygote from the fusion of two haploid gametes and it is immediately followed by mitosis and growth}. {The haploid gametes are short-lived } {Basic life cycle of animals and animal like protists} There are four possible points here the first two must be in the answer and either of the other two for a total of 3 points.

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 These protein building blocks were found in the material produced by the Miller-Urey experiment (two words) **Amino acids**
- 2.2 This nucleus is the larger of the two different nuclei found in ciliates. **Macronucleus**
- 2.3 Like the Archea the DNA of eukaryotes is packaged with these special proteins. **Histones**
- 2.4 Once these are assembled the next phase in the viral replication cycle is to exit from the host cell. **Virions**
- 2.5 What percentage of the sun's mass is not made up of the two atoms involved in the nuclear fusion reaction that produces the sun's energy? **Two**
- 2.6 Enveloped viruses may exit from the host cell by cell rupture or this process. **Budding**
- 2.7 Myosin motors travel along strands of this protein. **Actin**
- 2.8 During this stage of the viral life cycle hundreds if not thousands of new viral particles are released. **Lytic**
- 2.9 Protozoan's with cilia are given this common name. **Ciliates**
- 2.10 In the endosymbiont theory what type of metabolism did the bacterial cell have? **Aerobic**
- 2.11 When the second flagellum appeared in the bikonts it was used for this activity. **Swimming/Movement**
- 2.12 Mitochondrial DNA takes this bacterial shape. **Circle**
- 2.13 Water is the universal solvent for these types of molecules and compounds. **Polar**
- 2.14 This is the first type of cell attacked by the malaria parasite when it first enter the human host. **Liver**
- 2.15 Water filled spheres with a bilipid layer with embedded proteins are referred to as these. **Protocells/protobiont**
- 2.16 Geological eons are divided into these. **Eras**
- 2.17 These infectious agents contain no nucleic acids. **Prions**
- 2.18 Usual shape of the bacterial genome. **Circular**

- 2.19 From about 4,800 Ma to 3,800 Ma this eon saw the formation of our solar system and our planet earth. **Hadean** _____
- 2.20 This term describes life's origins as occurring somewhere other than the planet earth. **Panspermia**
- 2.21 This specialized cytoplasmic region contains the bacterial genome. **Nucleoid** _____
- 2.22 The late heavy bombardment in the history of the solar system marks the start of this Hadean phase. **Stabilizing** _____
- 2.23 Protista are traditionally considered to be algae if they do this and protozoans if they do not. **Photosynthesize** _____
- 2.24 Phylogenetic systematics is also called this. **Cladistics** _____
- 2.25 This chromosomal reorganization associated with meiosis increases genetic variation in Eukaryotes (Two words) **Crossing over / Random segregation**
- 2.26 Cytoskeletal microtubules are composed of this protein. **Tubulin** _____
- 2.27 This characteristic cell boundary is missing in viruses (Two words). **Plasma/cell membrane**
- 2.28 Chemical state of a compound that has lost an electron. **Oxidised** _____
- 2.29 The type of plankton that are the primary producers in the marine ecosystem. **Phytoplankton/algae**
- 2.30 In the prokaryotes gene regulation is based on this model. **Operon** _____

Part three of the exam is on the next page

STUDENT NUMBER: _____

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 How does the RNA first Hypothesis explain the origins of the Central Dogma in Biology; what is the Central Dogma?

{Central Dogma is that DNA contains the coded information that is transferred to RNA}
{Message RNA is then used to produce the protein or product that the genetic code codes for}
{DNA replicates itself} This may be drawn with a series of arrows .

{RNA world hypothesis is that RNA was the first self-replicating molecule of the three to appear}
{Evidence is that RNA is catalytic/catalytic in the ribosome/ reverse transcriptase for RNA - DNA}
{problem we can't produce the base nucleotide/problem small strings are insoluble}

First three points – proper explanation of the Central dogma. Three points for remainder for a total of 6 points

3.2 Describe the structure a bacterial flagellum

{Motor the moves the flagellum at the base} consists of {one point for listing only the structures of rings, shaft motor, hook flagellum with no reference to the relationship between them} OR 5 points with {rings embedded in the membranes and cell wall} {Central shaft of the motor in the rings} {Hook connects the shaft to the filament/may say this is flagellum is OK} {filament made entirely of protein} {Proton pump makes motor spin Motor spins and filament spins}