**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 8, 2014**

## 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 of 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.

Kinesin

{Type of molecular motor} {Travels along microtubules/cytoskeleton} {Moves away from centriole or negative end} {transport down axons} any three of four.

Synapomorphy
{Apomorphy is an advanced/derived trait/ modified from the original state}{Syn = Shared by all the descendents from the first with the trait} {shared derived traits}

Sympatric speciation

{Geographic/physical isolation is not required for speciation}
{first is that the speciation is occurring in same space/time}. { nature of the divergence is described - Example changes in diet. A population of one species of bird that diverges in beak size when food/seeds are either large or small and there are no intermediate sizes. Insects that spend their life on a food plant and there is a change in the host plant}

Eukaryote cilia
{9+2 arrangement of microtubules - drawn or explained with 9 doublets around the outside and pair inside}{Short and numerous on the surface} {beat with recovery beat at angle to power – or beat in metchronal wave}

**28 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 Bacteria that get their ATP from existing high energy bonds and carbon from carbon dioxide. _____**Chemoorganotrophs**_____

2.2 One of the advantages of a membrane surrounding the nucleus is that this part of gene expression is restricted to the nucleus. _____**Transcription**_____

2.3 These forces held the Earth's atmosphere in place. ____**Gravitational**____

2.4 The number of peripheral microtubular doublets in either a cilium or flagellum. _____**Nine**_____

2.5 Because of its stability and structure this biopolymer is not a good candidate as the first self-replicating set of molecules. _____**DNA**_____

2.6 The highly organized charged surface of these inorganic compounds may have been critical for the assembly of some of the first self replicating biopolymers. _____**Clays**_____

2.7 This process creates mRNA from DNA. _____**Transcription**_____

2.8 Abundant bacterial cytoplasmic inclusion involved in protein production. ____**Ribosomes**_____

2.9 This geological eon is the youngest and shortest. _____**Phanerozoic**_____

2.10 This eon occurs between the Proterozoic and Hadean. _____**Archean**_____

2.11 Fungal-like protists use this type of nutritional strategy (Two words). ____**Absorptive heterotrophy**____

2.12 The domain that doesn't include prokaryotes. _____**Eukarya**_____

2.13 The space between the two lipid layers of the Gram-negative bacterium. _____**Periplasm**_____

2.14 This chromosomal mutation associated with meiosis increases genetic variation in Eukaryotes (Two words) _____**Crossing Over**_____

2.15 Viroids are made up of this type of molecular polymer. _____**RNA**_____

2.16 Monophyletic groups have this number of ancestors. _____**One**_____

2.17 As an antibiotic, penicillin affects which part or layer of the bacterial cell wall. _____**Peptidoglycan/Outer**_____

2.18 This common gas in today's atmosphere was absent in the Hadean atmosphere. _____**Oxygen**_____

2.19 Cladists build these to depict the evolution of taxa and how they are related to each other. _____**Cladograms**_____

2.20 The membrane system surrounding the nucleus is only one part of this larger membrane system of cells. _____**Endomembrane**_____

2.21 Mitochondrial DNA takes this bacterial shape. _____**Circle/round**_____

2.22 This is the more fluid of the two types of cytoplasm found in an amoeba. _____**Endoplasm/Endo/Sol**_____

2.23 If a bacterium gets its high energy electrons from minerals or inorganic chemical elements you will see this as a part of the name describing their metabolism. _____**Litho**_____

2.24 This essential component required for translation is missing in a virus. So viruses have to use the ones in the host cell. _____**Ribosomes**_____

2.25 This mucilaginous glycocalyx surrounds the bacterial cell wall. _____**Capsule**_____

2.26 Catalytic ribozymes are evidence that this being the first self replicating biopolymer. _____**RNA**_____

2.27 The vacuole found in freshwater protists is involved in osmoregulation. ____**Contractile/Warer expulsion**_____

2.28 When the second flagellum appeared in the bikonts it was used for this activity. _____**Swimming**_____

**Part three of the exam is on the next page**

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

3.1 What evidence places the Archea as the sister group to the Eukarya?

In this question each of these is worth two points but to get the two points the whole explantion is required. One point of only part is there. Example same RNA polymerase would be one point but indicating its larger and more complex is the two point answer. Histones is one point two points packaging and stabilizing the DNA is two points.
Evidence {Both start protein translation with a methionine} {Both stabilize the folded DNA structure using histone proteins}{The RNA polymerase is a more complex enzyme in both groups}

3.2 Endosymbiosis was an important event in eukaryote evolution. What is endosymbiosis and give three examples.

3pts what is: {where originally separate organisms enguphed and living inside the other cell}benefit is described – {mitochondria gets carbohydrate and in return supplies ATP} and {chloroplast builds glucose for plant cell – plant provides water/access to light energy}

{Example 1: Mitochondria – incorporation of an aerobic bacteria}
There are two types of endosymbiosis in algae (Primary and secondary)
{Example 2: Algae - Chloroplast plastid – Incorporation of photosynthetic bacterium (cyanobacteria)}
{Example 3: Secondary Algae – eukaryote incorporates a algal cell (photosynthetic eukaryote)}

Not symbiosis this is a special case of cel within a cell.