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 60 pts

Saturday, October 13, 2012

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 or phrases 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.

LUCA
{Lowest/Last Universal Common Ancestor}{the organism from which all living things evolved/all domains of life – All life on earth descends}{A bacteria/archea/prokaryote} {that may have evolved here or from outerspace(Panspermia)}{arose during the Archean/3.5-3.8 Billion years ago}{Included the components of the Central Dogma} First two must be there and the whole abbreviation must be correct} additional point for either of the last two.

Physicalist

{explanation for how all organisms/animals were living things were like machines – MUST say living}{governed/behaved/explained by the rules/processes of Physics and Chemistry}{Humans weren't the same and this explanation didn't apply to humans} point each for a total of three points

Transmutation of the essence
{Organisms existed as fixed unchanging types that did not evolve – this was a consequence of the essence}{mutation of the essence created new organisms with a different essence}{there are no gradual changes instead new types appear immediately and spontaneous} One point each part, the idea must be present but it does not need to be worded exactly as worded here.

Why questions in science

{Ultimate cause}{Ask questions that deal with things such as evolution and relationships and the big picture}{Look for the larger patterns in a series of observations - ex when a stimulus causes an action or behaviour the question asks why did this behaviour evolve this way – there will no doubt be other examples but evolution is involved in Why questions }{report the findings as a story or narrative} { } Must have first two for a point each – either of the third or the fourth to give the maximum of 3 points

18 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 The validity of historical narrative was ignored as a result of the scientific revolution until the mid-1800's. This scientist revalidated the narrative as a true and sound scientific method. __**Darwin**_____

2.2 Short nucleotide and protein sequences share this property when placed in aqueous solutions. ___**Insoluble**_____

2.3 Marine invertebrates are the main multicellular life form in this geological era. _**Paleozoic**_____

2.4 The scientific revolution begins in this century. __**16th**_____

2.5 The computational power of the silica computer chip is the defining characteristic of which of Douglas Adams' age of sand to describe the modern era of science. __**Third**_____

2.6 These peoples who would sack Rome and send Europe into the Medieval or Dark ages. ___**Goths/Germanic tribe**

2.7 The invasion of land by animals and plants characterises this geological era. **Mesozoic**_____

2.8 This type of literature is written by the investigators that did the work and been reviewed by their colleagues in the field for accuracy. __**Primary**_____

2.9 Prokaryotes are before the kernel and eukaryotes have a true kernel - what's the kernel? **Nucleus**

2.10 With about twenty different building blocks it was long thought that this biopolymer was the genetic material. _**Protein**_____

2.11 This gas wasn't present in the earth's first atmosphere; its absence is why the early atmosphere was reducing. __**Oxygen**_____

2.12 This geological eon is the oldest and shortest. _**Phanerozoic/Hadean**__

2.13 To develop this, a scientist will either read up and study all the relevant literature that has been published on the topic or look for a pattern in a series of natural observations. **Hypothesis (not theory because a theory grows from many hypothesis)**

2.14 Whether it's protein or RNA that come first in the chemical origins of life doesn't affect the fact that whichever it was it had to be capable of doing this. **Replicating/Replication**

2.15 This fundamental theory of biology was proposed by a zoologist and a botanist. **Cell/cell theory**

2.16 If you don't take enough measurements your result may be subject to this type of error. **Sampling**

2.17 This started the formation of the universe (Two words). **Big Bang**

2.18. Your horoscope is this type of prediction. **Chronological**

Part three of the exam is on the next page

10 pts Part 3: Answer the following two questions in the space provided.

3.1 What is divergent evolution, give an example and explain its potential impact of our understanding of evolution?

{Based on homology}{a structure has similar embryonic/genetic/structural/ origins}{but different functions/appearance in different species} {ex. The one in class we used was the classic modification of the forelimb of the dog, whale, bat, bird, watch in case there are others that are acceptable}{Importance – allows the identification of a common ancestor in organisms that may not be visually the same}

3.2 In the chemical and biological evolution of the first cells how do scientists explain how the first organic small molecules appeared?

{Miller-Urey} – mimic the earths early atmosphere, with and explanation of the gases, water vapour and lightening} 2 points
{Deep see vents}- {unusual chemistry at high temperature and under great pressures created the molecules} 2 points
{Interstellar source – came in on space debris} There should be an overriding sense in the answer that we are talking about things like pyruvate, sugar, amino acids or the nucleotide rings.
{Only if the above detail is missing but a prebiotic soup is correctly described can a point be awarded}
This question is not related to panspermia since it asks about inorganic molecules from before the first cell