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 7, 2015

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) Cell phones must be in your bag or at the front of the room, NOT in your pockets or on the desk.

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: _____

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.

Prion

{proteinaceous infective agaent}{no DNA/RNA/geneteic information}{Causes proteins to transform and clump/stick together}{Causes: Mad cow disease/Bovine spongeform encephalopathy/Creutzfeldt-Jakob disease}

Disruptive selection

There are two ways that this can be described by either lower fitness in the midrange of a distribution {When fitness is decreased/organisms selected against}{mid-range of the distribution of the traits is disadvantages}or when increased fitness at the extremes {Fitness of the organisms increases}{at the extremes/tails of the distribution} {mean value remains the same} If a diagram is used it must clearly indicate whether it increased fitness of extremes or decreased fitness of mid-range. Say selection occurs at: is ambiguous.

Missense mutation
{When one base in codon – this point is to be clear that only one base in the triplet changes}{this point explains what happened - is substituted for another/base pair substitution}{ and one change in an amino acid change occurs in the protein}

Cenozoic

{Geological era}{in the Phanerozoic Eon/dates starts 65 million years ago extending to today}{End of the age of dinosaurs and the rise of Birds and Mammals – must have both parts}

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 Halophile bacteria love this. _____ **Salt** _____

2.2 Geological eras are combined into these larger units of time. _____ **Eons** _____

2.3 The sun is this kind of reactor. ___ **Nuclear** ____

2.4 This term describes the explosion of multicellular animal life forms that appeared 540 million years ago. _____ **Cambrian** ____

2.5 These vents are ruptures in the earth's crust in the deep parts of the oceans and may be a source of the first organic molecules. ____ **Hydrothermal** _____

2.6 The sum of the components of the Hardy-Weinberg equilibrium equation is always equal to this value. ____ **One** _____

2.7 These little hairs found on the surface of some bacteria are important for making cell to cell connections during conjugation. _____ **Pilli** _____

2.8 If the insect that forms the golden rod gall lived in a habitat with only predatory wasps and no woodpeckers, the shift in the size of the gall to larger galls would be an example of this type of selection. ____ **Directional** _____

2.9 The energy source for creating the concentration gradient across the bacterial cell membrane that fuels the bacterial molecular motor. _____ **ATP** _____

2.10 This one carbon hydrocarbon gas was present in the earth's original atmosphere. ____ **Methane** _____

2.11 The region where genetic exchange occurs between two ring species is referred to as this type of zone. ____ **Hybrid** _____

2.12 Efforts by conservation agencies to bridge the gap between small isolated populations of the same species are an example of this type of microevolutionary source of change (Two words). ____ **Gene Flow** ___

2.13 The engine for a bacterial flagellum is fuelled by the creation of a concentration gradient of these across the membrane. ____ **Protons** _____

2.14 The product of binary fission is two of these cells. ____ **Daughter** _____

2.15 Because this gas was missing the first forms of life lived under these conditions and had this type of metabolism. _____ **Anaerobic** _____

2.16 When a new dominant male takes over a pride of lions he eliminates the young cubs. This is an example of __ **Infanticide** __, a specific type of sexual selection involving male choice.

2.17 Solid, small lipid droplets suspended in solution but lacking an aqueous core. ___ **Microsphere** _____

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

2.19 If both alleles for a character are the same the organism is considered to be this. ____ **Homozygous** ____

2.20 From about 4,800 Ma to 3,800 Ma this eon saw the formation of our solar system and the planet earth. _____ **Hadean** ____

2.21 In this stage of the viral life cycle, the viral genome is combined with the bacterial genome. _____ **Lysogenic** _____

2.22 Bacterial reproduction where plasmids carry pieces of one bacterial genome and combine it with another's. ____ **Conjugation** _____

2.23 For the bacterial reproduction by transduction you need the help of this type of virus. ____ **Bacteriophage** ____

2.24 This abbreviation describes events that happened between 4.1-3.8 billion years ago. ____ **LHB** _____

2.25 One of the probable events that occurred between 3.8-4.1 billion years ago is that Uranus and this planet switched their relative positions orbiting the sun. _____ **Neptune** ____

2.26 Water is a major component of these large intergalactic travelling objects. ____ **Asteroids** ____

2.27 The distinction between the different Domains was first identified using the sequence of nucleotides in this macromolecular polymer. _____**rRNA**_____

2. 28 This hypothesis attempts to explain the origins of the first lipid layers surrounding an aqueous core. _____ **Bubble** _____

2.29 When one compound is oxidized there is always another that has been reduced. The two are referred to as being this (Two words) _____ **Redox pair** _____

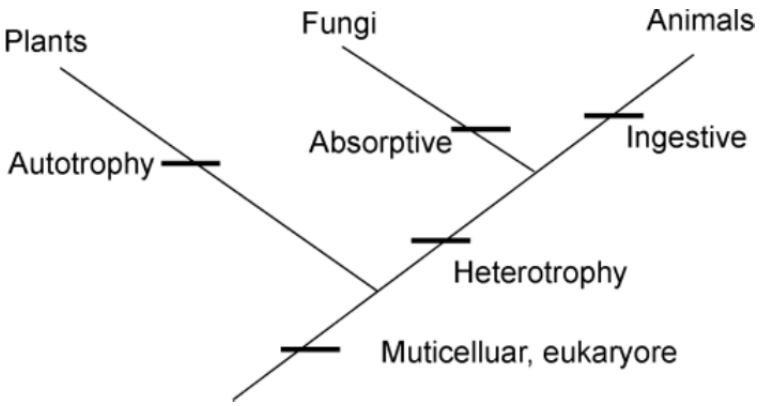
2.30 Non-random mating is also referred to as this type of selection. ___**Sexual**____

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

3.1 Describe the differences between the three multicellular Eukarya Kingdoms using a cladogram with these differences mapped as symplesiomorphies and autapomorphies.

If the students don't draw a cladogram the a point each for only defining the kingdoms: all parts must be here

- Plants – multicellular, eukaryote, autotrophs
- Animals – multicellular, eukaryote, ingestive heterotrophs
- Fungi – Multicellular, Eukaryote, absorptive heterotroph



1 point for the cladogram being drawn properly.
1 point for each apomorphy but they must be in the right order/sequence to generate the characters as described in the first part of the marking

3.2 Obtaining a carbon source for building organic molecules and harnessing the energy to do it is the basis of the metabolic diversity of Bacteria. Explain the differences or similarities between the following three: (1) Photoheterotrophs, (2) Chemoorganheterotrophs, and (3) Chemolithotrophs. Be sure to identify if any of these are found in Eukaryotes.

Similarities: {Both 1 and 2 use existing C-C bonds as a source of carbon}

Differences: {3 uses carbon dioxide as a source of carbon} All three obtain energy differently {1 uses light}{2 uses existing C-C bonds that are broken} {3 from minerals/change of charge/valance in minerals}

1 points – 2 is found in Fungi/Anmals