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 4, 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): _____

.

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

Convergent evolution

{Organism has a structure/something that has a similar function}{but the animals/organisms are not related to each other/ they don't descend from a common ancestor}{results in homoplasy/analogous} {ex. The one in class – there may be others wing of an insect and other winged vertebrates, wing of bat and bird (don't share same ancestor, wing of pterodactyl and others etc. Any pair from the winged groups of insects, flying reptiles (pterodactyls), birds and bats, ichthyosuaurs/dolphins, dolphins and fish biogeography where environments shape the appearance of an organism First two points Must be there either of the last two to give the total of three points.

Primary scientific literature

{Peer reviewed by other experts}{first publication of the results}{written by the scientists who did the study}

Environmental transformation (Essentialist theory)

{Organisms/organism's essence existed as fixed unchanging types that did not evolve}{Lamarck}{Use it or loose it created changes – a reference to environmental factors causing things to appear/disappear and that the appearance/disappearance was passed on to the next generation} One point each part, the idea must be present but it does not need to be worded exactly as worded here.

Hypothesis

{Based on observations}{makes a prediction or explanation of the pattern seen in the observation} {Can be tested to confirm this pattern/after multiple tests and confirmations it may become a theory} – If an example is used to answer the question be sure that all three of these components are clear in the example.

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 In Mendelian genetics the P generation. _____**Parental**_____

2.2 The fibre optic cable allowed transmission of data quickly over long distance and Douglas Adams felt it defined this age of scientific discovery. _____**Fourth**_____

2.3 Of the two types of sciences prior to 1930 those that believed that living things behaved according to the laws of physics and chemistry but has a special essence that made them living. _____**Vitalists**_____

2.4 As a young biologist you are asked to organize some never before seen animals. Some you can match to known ones but there is a very different group in the set and all of them have a radial symmetry but unlike the jelly fish no cnidocytes. You propose a new group of animals and name them the cubozoa because of their box like shape and their dissimilarity with the jellyfish. This is what type of reasoning? _____**Inductive**_____

2.5 When organisms from another population start to breed with a second population this occurs. (Two words) _____**Gene flow**_____

2.6 This is the preferred investigative method of the physical sciences. __**Experiment**_____

2.7 Type of mutation where there is an addition of single nucleotide in the sequence. _____**Frameshift/Point**_____

2.8 While Europe is plunged into the dark ages the Muslim word entered into this age (or era) of discovery. _____**Golden**_____

2.9 Most point mutations are of this type. _____**Neutral/Silent**_____

2.10 The Muslim scholar Avicenna combined the known medical knowledge of the Greek and Muslim world with this third great civilization. _____**India**_____

2.11 Number of Kingdoms in Linnaeus' classification. _____**Two**_____

2.12 This type of genetic drift occurs when a population is reduced to only a few survivors that remain in their original habitat. (Two words) _____**Bottle neck**_____

2.13 Taxon above a family but below a class. _____**Order**_____

2.14 In this type of review other scientists working in the same area as you look over your manuscript and make recommendation on whether it should be published. _____**Peer**_____

2.15 The type of reason used by the natural sciences works from the specific and tries to find generalized patterns. _____**Inductive**_____

2.16 The medieval ages came to an end at the start of this century_____**Sixteenth**_____

2.17 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**_____

2.18 If a major scientific finding is applicable throughout the universe it reaches this level, unfortunately biological facts will never reach this level if universality is the sole criteria. _____**Law**_____

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 How does mild and strong selection affect the genetic variability of a population? Give an example

{Mild selection only a small proportion of the population is selected against}{The allele selected against will decrease, decrease is only slight and the allele remains in the population} {Strong selection a large part of the population carrying the allele is lost} {Overtime the allele will disappear from the population/ fixation occurs as only one allele remains}{ex. Breeding of agricultural crops that have decreased variability – there will be answers that include the inadvertent fixation that resulted in the loss of tomato flavour and tomatoes were bred for packaging and marketing}

NOTE: Must explain the difference between mild and strong.

3.2 Scientists in the 18th and very early 19th century challenged the *Scala naturae*. Choose two scientists and briefly describe the evidence that challenged the long held belief.

{brief explanation of scala of the challenge of nothing changes and short time for earth}
Any two of these (NOTE: Darwin was the late 19th Century)
Scientist 1: {Georges-Louis Leclerc, Comte de Buffon} {studies in biography showed that animals changed in their form as the moved away from where they first appeared – It is not enough to say Biogeography there must be an explanation to show how biogeography creates species changes}
Scientis 2: {Cuvier} {Studies in extinction showed that there were animals that existed in the past that are not here now – Irish Elk and Mammoth may appear in the answer but they must make the link to change
Scientist 3: {Charles Lyell} {Geologist whose work on stratigraphy lead to the conclusion that the world is much older than the time frame suggested in the Scala}
Scientist 4: {Lamarck}{ Attempts to explain evolution by using inheritance acquired traits}

NOTE: The cut off of very early 19th century excludes C. Darwin from the answer.