

BIO1130 Final Examination – December 7, 2013

STUDENT NUMBER: _____

Don't enter your name.

BIO 1130 An Introduction to Organismal biology
Final examination
Worth 35% of your final grade
Total points for both parts of the exam is 110 pts

December 7, 2013

Part B: Written questions

- a) Place your name and student number in the space provided below. Be sure only your student number, is on the top of each of the following pages – the exam will be separated and if you name is not on a page your mark will be zero for that page. This part of the exam is worth 65 points.
- 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) A calculator is not required for the exam
- g) There are seven pages including this one in part B of the exam, be sure you have all seven pages

Name: _____

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18 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.

Protostome

{ Animals where the blastopore becomes the mouth – 2 Points } { example: Annelids, Molluscs, Arthropods, Platyhelminthes etc. } If the students include spiral cleavage and Schizocoel only 1 point not the two

Double fertilization

There is duplication of material in this question and there is a conflict with essay 3.3 DO NOT MARK this question.

Pollen

{ Male gamete/sperm in plants with seeds – must say seeds/Angiosperm/Gymnosperm } { four cells } { other cells form case of the pollen and will build pollen tube – this must show that the student understand that there are cells in the pollen grain that aren't involved in fertilization }

Lignin

{ Complex carbohydrate/biopolymer with phenolics/aromatic rings/carbons } { Forms the secondary plant cell wall } { Hydrophobic characteristics prevent water from interacting with cell wall allowing capillary transport/prevents bacterial contamination of fluids in the vessel }

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Pangea

{large supercontinent/continents combine into one/extended from North to south poles} {that forms at the end of the Paleozoic (Permian)/start of the Mesozoic (Triassic)} {fusion of Laurasia and Gondwana} {evidence of how it broke apart comes from fossils /global diversity patterns/create the continents of today }

Mass extinction

{Loss of more than {50% }of the genera/taxonomic group. They must be clear that it is not the loss of 50% of a species/population but some higher level of classification if only 50% one point if the meaning is clear a second point} {identify that there have been 5 mass extinctions/currently in the sixth – End Ordovician, Devonian, Permian, Triassic, Cretaceous – if named must be correct for the point although names not required for the answer} The definition is about what is a mass extinction not what causes it because there are different causes for each of the different events and none are common to all.

Anything written below this line will not be marked.

29 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.

- 2.1 The type of symmetry characteristic of cnidarians. **Radial**
- 2.2 The addition of this mineral to the skeleton occurs in all gnathostomes except the sharks and rays (Chondrichthyes). **Calcium**
- 2.3 One of the consequences of not having any mesoderm is that you don't have these either. **Muscles/Mesenteries**
- 2.4 The type of scales found only in cartilaginous fish. **Placoid**
- 2.5 This arthropod was abundant during the Cambrian and although it survived into the Ordovician it is now extinct. **Trilobite**
- 2.6 Pollen contains which gamete? **Sperm/Male**
- 2.7 The base of the feather that emerges from the follicle that forms it. **Quill**
- 2.8 This biopolymer on the surface of leaves helps prevent water loss. **Wax/cuticle**
- 2.9 Only when conditions are favourable does this stage in the moss life cycle occur. In other words, most times when you look at a moss you aren't seeing this stage of the life-cycle. **Sporophyte**
- 2.10 Of the two types of muscles in worms important in the function of the hydrostatic skeleton, these stretch the muscles oriented in line with the anterior to posterior axis of the worm. **Circular**
- 2.11 The secondary plant cell wall is formed primarily from this substance. **Lignin**
- 2.12 This type of reptile skull had two openings in the skull to accommodate the jaw muscles. **Diapsid**
- 2.13 The new geological period that precedes the Cambrian. **Ediacaran**
- 2.14 This type of skeleton is the least dense of the skeletons found in fish and its use is an adaptation attempting to achieve neutral buoyancy. **Cartilage**
- 2.15 Without any limbs to hold onto captured prey many snakes immobilize their victims using **Venom/constriction**
- 2.16 In the relationship between plant roots and fungi the plant provides this as part of their relationship. **Sugars/glucose**
- 2.17 Have new animal phyla appeared since the Cambrian explosion? **No**
- 2.18 Number of flagella on the moss sperm cell. **Two**
- 2.19 Moss and liverwort spores are similar in size and appearance, a condition referred to as this.

Homosporous

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- 2.20 This cavity is missing in an acoelomate animal. **Coelom/not body cavity**
- 2.21 Although it's not a tissue, because sponges don't have them, the cells lining the spongocoel are collectively called this. **Choanoderm**
- 2.22 Like feathers, these help insulate mammals and are a diagnostic character of this vertebrate class. **Hairs?fur**
- 2.23 One of two fates for the fused nuclei that result from fungal sex. **Zygospore**
- 2.24 Reptile eggs have these and amphibian eggs don't and are the reason that reptiles can survive on land. **Membranes/shell/amnion**
- 2.25 The fungus roots of plants are more appropriately called these. **Ecto/Mycorrhiza**
- 2.26 The spore producing plant in the life cycle. **Sporophyte**
- 2.27 These genes control pattern in multicellular organisms. **Homeotic/Hox/homobox**
- 2.28 The Doushantuo fossils resemble this stage in the life cycle of a multicellular organism.
Embryo
- 2.29 Female gametophytes in gymnosperms develop from this spore type. **Megaspores**

Part three of the exam is on the next page

18 pts Part 3: Answer the following three questions in the space provided. Each answer is worth 6 points

3.1 Molluscs are part of the Cambrian explosion. What is the Cambrian explosion and what aspects of the Mollusca body plan demonstrate some of the reasons for the explosion?

What 2 pts: {The appearance of all the multicellular animal body plans suddenly} {During the Cambrian era – must have era for the point or that is was about 500 million years ago}

First reasons for explosion and its link to molluscs

2 pts: {burrowing animals were able to break through the impermeable algal/bacterial mat on the ocean floor to reach a new food source} {Mollusc link the radula allowed the group to do this}

Second reasons for explosion and its link to molluscs

2 pt: {the ability to remove calcium from the water and produce mineralize shells} {Molluscs built shells and used them to hide from predators that appeared during the Cambrian}

3.2 Mammalian teeth differ from those of all vertebrates. What are these differences and what is the advantage of having these differences.

Difference 1 2pts: {In other vertebrates the teeth are all similar on appearance (homodont). In mammals there are different types of teeth on the jaw (heterodont)} this question is worth one point without the terms heterodont and homodont}

Difference 2: 3pts Other vertebrates {give an example from a non-mammalian group - have the same number of teeth along the jaw there entire life / replace them constantly – must have both of these for the point} {Mammals have two pairs of teeth (Diphyodont/or teeth that are shed (Deciduous) – 1 point if the terms are missing 2 points if the terms are there}

Advantage 1 pt: {Process the food before it was ingested allowing for more efficient digestion/allowed specialization for different food types/ omnivores/ herbivores/ carnivores}

3.3 What is double fertilization? In what group of plants would you find it and what is the advantage of double fertilization in that type of plant's life cycle?

Group 4pt: {Angiosperm/Flowering plants} {Generative nucleus in pollen divides and produces two nuclei} {One of the nuclei of the egg to form the zygote} {The other nucleus fertilizes of the central cells to form endosperm}

Advantage 1 2 pts: {Endosperm is 3n/polyploidy/multiple copies of the genome} {polyploidy allows for rapid production of endosperm that is the nutrient for the developing embryo}

OR

Advantage 2 2 pts: {In Gymnosperm/Conifers all the megasporangia were fully developed and may not be fertilized. With double fertilization nutrient supply to developing embryo is only produced if there is fertilization}

Anything written below this line will not be marked.
