Student Number: _____ Seat Number_____

BIO 1130FF

An Introduction to Organismal biology
Final examination
Worth 35% of your final grade

December 7, 2013

Part A: Multiple choice questions
40 points (1 point/question)

a) Fill in the bubbles for your name and student number and BIO1130FF for the course code. Fill in the same information in text in the boxes above the bubbles.

b) Use only a pencil to fill in the answer sheet. If you erase a question be sure to erase all of the pencil mark. Don't place any marks anywhere on the sheet other than where the bubbles are for personal information or your answers.

c) Do not place any answers on the question sheet.

d) This is not an open book exam.

e) A calculator is not required for this exam

f) **CAUTION to minimize paper waste this part of the exam has been printed back to back**

NOTE: If you do not fill in the student number and course code as **BIO1130FF** it will be impossible to identify your answer sheet and you will receive a **ZERO** for this part of the exam

FF.1 Which of the following is true in the pine life cycle?
a. Gametophytes originate within and are dependent upon sporophytes.
b. Both gametophytes and sporophytes are totally independent from each other and are equally dominant.
c. Sporophytes originate within and are dependent upon gametophytes.
d. Gametophytes are free living and photosynthetic, but are replaced by a dominant sporophyte generation.

FF.2 Reptiles of the _____ lineage had one opening in the temporal region of the skull.
a. diapsid
b. synapsid
c. triapsid
d. amphiapsid
e. anapsid

FF.3 The fusion of the fungal nuclei is
a. karyogamy.
b. cytoplasmic streaming.
c. plasmogamy.
d. symbiosis

FF.4 _____ glands are associated with hair follicles and secrete oil.
a. Eccrine
b. Sebaceous
c. Sudoriferous
d. Apocrine
e. Musk

FF.5 What distinguishes a coelomate animal from a pseudocoelomate animal is that coelomates
a. have a body cavity completely lined by mesodermal tissue, whereas pseudocoelomates do not.
b. have a gut that lacks suspension within the body cavity, whereas pseudocoelomates have mesenteries that hold the digestive system in place.
c. contain tissues derived from mesoderm, whereas pseudocoelomates have no such tissue.
d. have a body cavity, whereas pseudocoelomates have a solid body.
e. have a complete digestive system with mouth and anus, whereas pseudocoelomates have a digestive tract with only one opening.

FF.6 Which of the following characteristics is not found in liverworts?
a. asexual reproduction by gemmae
b. sexual reproduction when motile sperm swim outside the plant to the egg
c. sporophyte grows within the parent gametophyte
d. central strand of primitive conducting tissue

FF.7 The mycelium that gives rise to basidiocarps is generally _____.
a. haploid
b. diploid
c. dikaryotic
d. mostly haploid but with a few diploid reproductive cells

FF.8 Basidiomycetes are the only fungal group capable of synthesizing lignase. What advantage does this group of fungi have over other fungi because of this capability?
a. This is always the first group of fungi to begin any kind of plant decomposition.
b. This fungal group can break down the tough lignin, which cannot be harnessed for energy, to get to the more useful cellulose.
c. This is the only group of fungi that can use lignin for ATP production.
d. This enzyme releases heat energy from the breakdown of lignin that is used to kill off competing fungi.

FF.9 Now extinct, several lineages of ____ appear in the fossil record from the Ordovician through the Devonian periods. These jawless fishes had skin heavily armoured with bony plates and scales, and imprints of some of their fossils indicate that their brains had three regions.
a. acanthodians
b. conodonts
c. ostracoderms
d. placoderms

FF.10 Which of the following sequences properly depicts the plant life cycle?
a. zygote, sporophyte, spore, gametophyte, gametes, zygote
b. zygote, gametophyte, gametes, sporophyte, spore, zygote
c. zygote, spore, sporophyte, gametes, gametophyte, zygote
d. zygote, gametes, gametophyte, spore, sporophyte, zygote

FF.11 Which of the following characteristics is present in both vascular and nonvascular plants?
a. stomata
b. lignin
c. apical meristem
d. roots, stems, and leaves

FF.12 Bilateral symmetry is advantageous primarily because it allows for the development of _____.
a. a specialized body cavity.
b. a hydrostatic skeleton.
c. limbs for the infant to attach to a parent.
d. duplicate body parts in case of injury.
e. a specialized head and posterior.

FF.13 Monotremes differ from other mammals in that they _____.
a. do not maintain elevated body temperatures
b. do not nurse their young with milk
c. lay eggs
d. do not have a four-chambered heart

FF.14 Which of the following were the dominant land plants during the Mesozoic era, from about 250 million years ago to 65 million years ago?
a. Liverworts
b. angiosperms (Flowering plants)
c. bryophytes (mosses)
d. gymnosperms (conifers)

FF.15 Mating types in fungi are generally termed
a. sperm and eggs.
b. plus and minus.
c. alpha and beta.
d. male and female.

FF.16 Which of these are structures in a gametophyte generation?
a. egg, sperm, zygote, embryo, seedling
b. spores, egg, sperm, pollen, archegonium
c. leaves, stems, roots, flowers, cones
d. antheridium, embryo, seed, spores, flower

FF.17 A lophophore is used by bryozoans
a. For locomotion
b. In the larval stage of the life cycle
c. For feeding
d. For sensory perception
e. As a skeletal system

FF.18 The adaptation of bivalve clams to sedentary, filter feeding life-styles involved loss of the _____ and the radula.
a. mantle
b. foot
c. head
d. visceral mass
e. siphons

FF.19 The shell of a mollusc is secreted by the
a. radula.
b. mantle.
c. periostracum.
d. foot.
e. visceral mass.

FF.20 Which of the following statements about antheridia is correct?
a. They are found in all land plants.
b. They are found in all land plants except seed plants.
c. They are found in all land plants except angiosperms.
d. They are found in nonvascular land plants but not in vascular plants.

FF.21 The rasping/grinding structure occurring in the mouth of most molluscs is the
a. Tongue.
b. nacre.
c. odontophore.
d. operculum.
e. radula.

FF.22 An advancement that reptiles show over amphibia is
a. A tough scaly skin that provides protection against desiccation.
b. Lungs that can be ventilated by movements of the thoracic cavity
c. A shelled egg that can be laid on land
d. All of these

FF.23 In septate fungi, what structures allow cytoplasmic streaming to distribute needed nutrients, synthesized compounds, and organelles throughout the hyphae?
a. two nuclei
b. tight junctions that form in cross walls between cells
c. complex microtubular cytoskeletons
d. multiple chitinous layers in cross walls
e. pores in cross walls

FF.24 Specialization of regions of the body for specific functions, as seen in the arthropods, is called
a. tagmatization.
b. metamerism.
c. truncation.
d. differentiation.
e. cephalization.

FF.25 Heterospory refers to having
a. two spore types.
b. male and female gametes.
c. separate male and female plants.
d. both sporophyte and gametophyte generations.
e. both male and female parts on the same plant.

FF.26 The outer layer of the arthropod exoskeleton called the _____ is made of a waxy lipoprotein, which makes it impermeable to water.
a. procuticle
b. mesocuticle
c. epicuticle
d. endocuticle
e. sclerocuticle

FF.27 Which of the following correctly describes an evolutionary trend that occurred as land plants evolved?
a. becoming seedless
b. producing only one type of spore
c. producing nonmotile gametes
d. haploid generation becoming dominant

FF.28 Which of the following events marks the start of the Phanerozoic eon?
a. explosion of marine invertebrates and multicellular life
b. The dominace of anaerobic life
c. A stable oxygen environment and the appearance of protists
d. The origins of life

FF.29 The snowball Earth hypothesis provides a possible explanation for the
a. Diversification of animals during the late Proterozoic
b. Oxygenation of the Earth's seas and atmosphere
c. Colonization of the land by plants and fungi.
d. Origin of O_2-releasing photosynthesis
e. Existence of prokaryotes around hydrothermal vents on the ocean floor

FF.30 Periodic shedding of the arthropod exoskeleton is called
a. sclerotization.
b. ecdysis.
c. calcification.
d. articulation.
e. metamorphosis.

FF.31 The fungal cell called a dikaryon contains_____.
a. immature haploid spores
b. two identical diploid nuclei
c. two nonidentical haploid nuclei
d. a diploid zygote

FF.32 To colonize land, plants had to overcome a number of difficulties. However, once this occurred they were able to exploit more abundant resources. Which of the following resources are more plentiful on land than in water?
a. carbon dioxide
b. nitrogen
c. light
d. water

FF.33 The substance that typically provides rigidity to fungal cell walls is
a. cellulose.
b. lignin.
c. starch.
d. chitin.

FF.34 Best describes muscle organization in a nematode
a. layers of longitudinal and circular muscle
b. bands of longitudinal muscle
c. a single layer of circular muscle
d. a single layer of longitudinal muscle
e. none of the above

FF.35 The water movement in the body of a cephalopod (squid for example) mollusc provides:
a) Oxygen for respiration
b) Jet power for rapid locomotion
c) A way to carry wastes out of the body
d) All of these

FF.36 Arrange the following adaptations to terrestrial life in the order in which they first appeared during the evolution of land plants:
1. seeds; 2. vascular tissue; 3. gametangia; 4. flowers
a. 1, 2, 3, 4
b. 2, 3, 4, 1
c. 2, 3, 1, 4
d. 3, 2, 1, 4

FF.37 The ____ is a protective structure where sperm cells are formed in bryophytes and some other plants.
a. strobilus
b. archegonium
c. sporangium
d. antheridium
e. stoma

FF.38 Modern amphibians
a. closely resemble their Paleozoic ancestors
b. always occupy terrestrial habitats as adults
c. never occupy terrestrial habitats as adults
d. are generally larger than their Paleozoic ancestors

FF.39 How many hox gene complexes are found in vertebrates?
a. None; only invertebrates have hox genes.
b. One complex, but it has many more hox genes than are found in invertebrates.
c. Exactly two complexes, each with many hox genes.
d. Between two and seven complexes, each with many hox genes.

FF.40 Fungi have an extremely high surface-area-to-volume ratio. What is the advantage of this to an organism that gets most of its nutrition through absorption?
a. This high ratio creates more room inside the cells for additional organelles involved in absorption.
b. This high ratio means that fungi have a thick, fleshy structure that allows the fungi to store more of the food it absorbs.
c. The lower volume prevents the cells from drying out too quickly, which can interfere with absorption.
d. The larger surface area allows for more material to be transported through the cell membrane.

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Total points for both parts of the exam is 110 pts

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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 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) 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: _____

Student number: _____

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

Double fertilization

Pollen

Lignin

Pangea

Mass extinction

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. _____

2.2 The addition of this mineral to the skeleton occurs in all gnathostomes except the sharks and rays (Chondrichthyes). _____

2.3 One of the consequences of not having any mesoderm is that you don't have these either. _____

2.4 The type of scales found only in cartilaginous fish. _____

2.5 This arthropod was abundant during the Cambrian and although it survived into the Ordovician it is now extinct. _____

2.6 Pollen contains which gamete? _____

2.7 The base of the feather that emerges from the follicle that forms it. _____

2.8 This biopolymer on the surface of leaves helps prevent water loss. _____

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. _____

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. _____

2.11 The secondary plant cell wall is formed primarily from this substance. _____

2.12 This type of reptile skull had two openings in the skull to accommodate the jaw muscles. _____

2.13 The new geological period that precedes the Cambrian. _____

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. _____

2.15 Without any limbs to hold onto captured prey many snakes immobilize their victims using _____.

2.16 In the relationship between plant roots and fungi the plant provides this as part of their relationship. _____

2.17 Have new animal phyla appeared since the Cambrian explosion? _____

2.18 Number of flagella on the moss sperm cell. _____

2.19 Moss and liverwort spores are similar in size and appearance, a condition referred to as this.

2.20 This cavity is missing in an acoelomate animal. _____

2.21 Although it's not a tissue, because sponges don't have them, the cells lining the spongocoel are collectively called this. _____

2.22 Like feathers, these help insulate mammals and are a diagnostic character of this vertebrate class. _____

2.23 One of two fates for the fused nuclei that result from fungal sex. _____

2.24 Reptile eggs have these and amphibian eggs don't and are the reason that reptiles can survive on land. _____

2.25 The fungus roots of plants are more appropriately called these. _____

2.26 The spore producing plant in the life cycle. _____

2.27 These genes control pattern in multicellular organisms. _____

2.28 The Doushantuo fossils resemble this stage in the life cycle of a multicellular organism. _____

2.29 Female gametophytes in gymnosperms develop from this spore type. _____

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 molluscan body plan demonstrate some of the reasons for the explosion?

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

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?

Anything written below this line will not be marked.