

BIO 1130FF

An introduction to Organismal biology
Midterm examination
Worth either 15% or 20% of your final grade

Saturday, November 10, 2012

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

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.

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.

Do not place any answers on the question sheet.

This is not an open book exam.

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

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Multiple choice questions - Place your answers on the answer sheet

- FF.1 What is the correct order in the history of life on Earth?
- first prokaryotes, first eukaryotes, animals, land plants, humans
 - humans, animals, land plants, first eukaryotes, first prokaryotes
 - land plants, first prokaryotes, animals, first eukaryotes, humans
 - animals, first prokaryotes, first eukaryotes, land plants, humans
- FF.2 In a(n) ____ cycle, the virus kills the infected host cell.
- lytic
 - phagocytic
 - endocytic
 - lysogenic
- FF.3 The major structural component of bacterial cell walls is
- proteoglycan.
 - peptidoglycan.
 - cellulose.
 - arabinogalactan.
- FF.4 Which of the following is characteristic of the viral lytic cycle
- Many bacterial cells containing viral DNA are produced
 - Viral DNA is incorporated into the host genome
 - The viral DNA replicates without destroying the host
 - A large number of viral phages is released at one time
 - The virus-host relationship usually lasts for generations
- FF.5 Carl Woese and collaborators identified two major branches of prokaryotic evolution. What was the basis for dividing prokaryotes into two domains?
- ecological characteristics such as the ability to survive in extreme environments
 - genetic characteristics such as ribosomal RNA sequences
 - metabolic characteristics such as chemoautotrophy and photosynthesis
 - metabolic characteristics such as the production of methane gas
 - microscopic examination of staining characteristics of the cell wall
- FF.6 The protein layer surrounding the viral genome is called
- a capsid.
 - a capsule.
 - an envelope.
 - a cell membrane.
- FF.7 Viruses are considered nonliving because they
- lack a nucleus.
 - lack a cell wall.
 - cannot reproduce outside a host cell.
 - contain RNA as their genetic material.

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FF.8 Which free-living cells were the earliest contributors to the formation of Earth's oxidizing atmosphere?

- a. endosymbionts
- b. mitochondria
- c. seaweeds
- d. cyanobacteria
- e. chloroplasts

FF.9 Biologists sometimes divide living organisms into two groups: autotrophs and heterotrophs. How do these two groups differ?

- a. They use different sources of carbon.
- b. They use different sources of energy.
- c. They use different electron acceptors.
- d. They differ in the way they generate ATP.

FF.10 The collar of a choanocyte

- a. Regulates the diameter of the osculum
- b. Filters food from the water
- c. Regulates the diameter of the openings in wall of a sponge
- d. Secrete the digestive enzymes

FF.11 Specialized cells in sponges are capable of doing all but one of the following

- a. detect environmental stimuli using nerve cells
- b. Regulate the flow of water through the sponge
- c. Secrete the skeleton
- d. Extract nutrients from water
- e. Produce gametes

FF.12 In diploblastic organisms the two embryonic layers are:

- a. Mesoderm and endoderm
- b. Mesoderm and mesoglea
- c. Ectoderm and mesoderm
- d. Mesoglea and blastoderm
- e. Ectoderm and endoderm

FF.13 The sperm duct transports gametes from this organ to the seminal vesicles of a flatworm

- a: testes
- b: ovary
- c: yolk Gland
- d: ootype

FF.14 Free living flatworms move over the substrate using muscles and these for locomotion

- a. Cilia
- b. Parapodia
- c. Pseudopodia
- d. Flagella
- e. Legs

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- FF.15 The rasping/grinding structure occurring in the mouth of most molluscs is the
- tongue.
 - nacre.
 - odontophore.
 - operculum.
 - radula.
- FF.16 The original function of the water vascular system of echinoderms was probably
- locomotion.
 - feeding.
 - excretion.
 - respiration.
 - circulation.
- FF.17 All of the following are true about colonial choanoflagellates except:
- they reproduce asexually.
 - they are suspension feeders.
 - they are sessile.
 - they are animals.
 - they live in aquatic habitats.
- FF.18 Which embryonic cell layer develops into the lining of the gut in most animals?
- mesoglea
 - endoderm
 - epidermis
 - ectoderm
- FF.19 Microbiologists use the Gram stain to aid in identification of bacteria. What is the major difference between Gram-positive and Gram-negative bacteria?
- structure of the lipids in the plasma membrane
 - presence or absence of muramic acid in the cell wall
 - presence or absence of outer membrane
 - presence or absence of peptidoglycan in the cell wall
- FF.20 Of what advantage is a large surface-area-to-volume ratio to the Platyhelminthes?
- It enables them to live in dry habitats.
 - It enables their blood vessels to transport oxygen and carbon dioxide more efficiently.
 - It enables the efficient transport of gases and nutrients without specialized structures.
 - It enables them to survive on very little oxygen.
 - None of the above are advantages.
- FF.21. What do all sponges have in common?
- They always reproduce sexually.
 - They all live on the bottom in an aquatic environment.
 - They all practice external fertilization.
 - All adults are free swimming.
 - They all have three germ layers.

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- FF.22. You are trying to identify an organism. It is an animal, but it does not have nerve or muscle tissue. It is neither diploblastic nor triploblastic. It is probably a
- flatworm.
 - snail.
 - sponge.
 - jelly.
 - comb jelly.
- FF.23 What do all deuterostomes have in common?
- All have specialized head and tail regions.
 - The pore formed during gastrulation becomes the anus.
 - Adults are bilaterally symmetrical.
 - Embryos have pharyngeal pouches that may or may not form
- FF.24 Animals that have a fluid-filled cavity that separates the gut from the muscles of the body wall and have that cavity completely lined by the muscles are said to be
- mesenteries.
 - coelomate.
 - pseudocoelomate.
 - indeterminate.
- FF.25 Alternation of generations occurs in protists. Which of the following represents the correct sequence of events for this mode of reproduction?
- sporophyte → spore fusion → gametophyte → gamete → sporophyte
 - gametophyte → gamete → fusion → sporophyte → spore → gametophyte
 - gametophyte → fusion → sporophyte → spore → gamete → gametophyte
 - gamete → fusion → gametophyte → spore → sporophyte → gamete
- FF.26 The major evolutionary split of protostome animals was into _____.
- segmented and nonsegmented animals.
 - diploblasts and triploblasts.
 - lophotrochozoans and ecdysozoans.
 - Coelomates and acoelomates.
 - Arthropods and molluscs.
- FF.27 An adult animal that possesses bilateral symmetry is most certainly also
- a deuterostome.
 - eucoelomate.
 - triploblastic.
 - the product of metamorphosis.
- FF.28 According to the endosymbiotic theory of the origin of eukaryotic cells, how did mitochondria originate?
- from infoldings of the plasma membrane, coupled with mutations of genes for proteins in energy-transfer reactions
 - from the nuclear envelope folding outward and forming mitochondrial membranes
 - when a protoeukaryote engaged in a symbiotic relationship with a protobiont
 - by secondary endosymbiosis
 - from engulfed, originally free-living prokaryotes

BIO1130 Midterm Examination – November 10, 2012

STUDENT NUMBER: _____

Don't enter your name.

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Total points for both parts of the exam is 85 pts

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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 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) 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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STUDENT NUMBER: _____

Don't enter your name.

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.

Unikont

Eukarya

Trochophore

Radial symmetry

STUDENT NUMBER: _____

Don't enter your name.

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 This type of fission in protists creates two equal daughter cells. _____
- 2.2 The internal structure of a cilium, or flagellum, is referred to as a _____ plus two organization of microtubules. _____
- 2.3 Planaria, a free-living flatworm, feeds by using this structure to get food into its digestive tract. _____
- 2.4 Some bacteria survive by using sulfur compounds in their energy pathways and carbon dioxide as a carbon source- it's referred to as this type of nutritional strategy. _____
- 2.5 From which domain does the symbiont come from in secondary endosymbiosis. _____
- 2.6 Number of microtubular strands in each of the nine outer components of a centriole. _____
- 2.7 If you are looking straight into the mouth of a hydrozoan, this surface is facing you. _____
- 2.8 The engine for a bacterial flagellum is fuelled by the movements of these across the membrane. _____
- 2.9 This type of symmetry is found in the phylum Platyhelminthes. _____
- 2.10 In terms of their 'gram' designation these bacteria have the reinforcing elements of the cell wall at the surface, they stain. _____
- 2.11 The structure on a choanocyte that propels the water through a sponge. _____
- 2.12 Cnidarians remove undigested food from the gastrovascular cavity through this. _____
- 2.13 Pathogenicity of Gram-negative bacteria is often associated with this membrane layer of bacterial cell wall.
- 2.14 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. _____
- 2.15 Unlike the Archean eon before it, the Proterozoic was characterized by this type of respiration. _____

STUDENT NUMBER: _____

Don't enter your name.

- 2.16 This type of gliding was probably a precursor to movement in the first eukaryote cells. _____
- 2.17 In the life cycle of the plant-like protists the diploid stage is this. _____
- 2.18 Number of membranous lipid bilayers surrounding the contents of mitochondria. _____
- 2.19 This additional circular piece of DNA is found in some bacterial cells. _____
- 2.20 Term for the feeding strategy of bacteria that consume their carbon in an organic form. _____
- 2.21 This unique cell gives the Cnidaria its name. _____
- 2.22 Bacteria that get their ATP from existing high energy bonds and carbon from carbon dioxide. _____
- 2.23 These suspension feeding and the simplest of animals architectures appears prior to the Cambrian period. _____
- 2.24 The common name for the phylum Platyhelminthes. _____
- 2.25 This geological period follows the Cambrian period. _____
- 2.26 This is the sessile stage in the cnidarian life cycle. _____
- 2.27 Membrane system surrounding the genetic material in eukaryote cells (two words). _____
- 2.28 The part of the amoeba where the ectoplasm is converted back into endoplasm.

STUDENT NUMBER: _____

Don't enter your name.

5 pts Part 3: Use the letter for the pathogen, the cause of the disease, in the first column to identify the type of pathogen that causes the disease in the second column by placing the appropriate letter in the space before the disease. You may have to use a pathogen type twice in your answer and if there are two possible answers use the pathogen that is most precise and accurate.

Pathogen	Disease
A: Retrovirus	_____ Mad cow disease
B: Virus	_____ Hepatitis D
C: Protists	_____ Acquired immune deficiency syndrome
D: Prion	_____ Malaria
E: Viroid	_____ Influenza
F: Bacterium	

Part four of the exam is on the next page

STUDENT NUMBER: _____

Don't enter your name.

12 pts Part 4: Answer the following two questions in the space provided.

4.1 What are the similarities and differences in the skeleton and muscle organization between a Platyhelminthe, flatworm, and a nematode, roundworm? How does this affect the way they move? In your answer be sure that the similarities and differences are clear. When you describe either be sure that both animals are mentioned at the same time.

4.2 How is the dynein motor used for locomotion in protists