BIO 2135 - Animal Form and Function
Midterm examination
Worth either 10% or 15% of your final grade

Tuesday March 7, 2011

a) Place your name and student number in the space provided below. Be sure that your name is on the top of each page because the exam **will** be separated to facilitate marking

b) Circle the lab section for your lab.

c) Check to be sure that your exam is complete with a total of 13 pages including this one

d) Answer all questions in the space provided on the exam. Do not transfer answers to the back of the page

e) There is a bonus in part 4 – do one extra question from part four for the bonus

f) The exam is out of 85 pts.

Name:_____

Student No: .....

Circle your lab section:

Thursday: A1-BSC312, A3-BSC330, A5-BSC335, A7-BSC 310

Friday: A2-BSC312, A4-BSC330 A6-BSC335

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Name:..... Student Number: .....

15pts Part 1. Briefly explain what each of the following biological terms means. Where possible include an example in your definition from a group or an organism to which the term applies.

Renette cell

{nematodes}{assumed to be excretory and/or osmoregulatory organ} {function is not really clear}{Forms the laterial line/a part of the lateral line}

Funiculus

{Bryozoa/Lophophorate animals}{Connected to/part of the digestive system}{System to circulate nutrients between members of the colony}

Peristracum layer/Nacreous layer

Periostracum: {Layer/part of the Mollusc shell}{Outer layer}{mix of protein and calcium salts}{protects shell from damage from acidification} – any three for the points

Nacreous layer: {Layer/part of the Mollusc shell}{Inner layer}{Mother of Pearl/makes pearls} {protects mantle from abrasion/damage from particles}

Nephridiopore/ Nephristome

Nephridopore: {part of a matenephridium – must say metanephridium nephridium doesn't get the points}{Opening is in the body wall} {releases modified of coleomic fluid}

Nephrostome: {part of a matenephridium – must say metanephridium nephridium doesn't get the points}{Opening is in the coelomic space}{collects or pulls in coelmic fluid that needs to be filtersd}

Lophoptrochozoa

{Infrakingdom/or taxon of animals – some indication that this is a formal taxonomic name} {no single morphological character unites the group} {Have either trochophore larva or a lophophore}

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21 pts Part 2 Answer each of the following multiple choice questions by placing and X in the space to the left of the correct choice. There is only one correct answer for each question and questions have either 4 or 5 answers to choose from.

2.1 Reproductively, leeches are:

_____A. protogynous.

__X__B. monoecious.

_____C. parthenogenetic.

_____D. dioecious.

_____E. asexual.

2.2 The open, ciliated funnel of a metanephridium is called the

_____A. infundibulum.

_____B. chloragogen (Cloragogue)

__X__C. nephrostome.

_____D. nephridiopore.

_____E. flame bulb.

2.3 In nematodes the copulatory spicules function to:

_____A. attract the female.

_____B. deliver sperm to the female vagina or gonopore.

__X__C. hold the female gonopore open against hydrostatic pressure.

_____D. store sperm in the male until copulation occurs.

_____E. store sperm in the female after copulation.

2.4 The circulatory system of most molluscs is:

_____A. hydraulic.

_____B. incurrent.

_____C. closed.

_____D. excurrent.

__X__E. open.

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2.5 External respiratory exchange in most annelids is accomplished by

_____A. ventilation.

_____B. active transport.

_____C. endocytosis.

_____D. facilitated diffusion.

____X____E. simple diffusion.

2.6 Bilaterally symmetric animals

_____A. Can be divided into two identical halves by any plane passing through the oral aboral axis.

_____B. Are generally active predators

_____C. Always have a complex body plan

____X____D. None of the above

2.7 In the annelids a tissue called _____ is a site of amino acid metabolism

_____A. liver

_____B. typhlosole

____X____C. chloragogen (chloragogue)

_____D. clitellum

_____E. kidney

2.8 The radula has a cartilaginous support called the:

_____A radula sac

_____B. Ctenidium

____X____C. Odontophore

_____D. lamella

_____E. osphradium

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2.9 Of the following features that are characteristic of polychaetes, which one is lacking in leeches?

_____A. segmentation

_____B. setae

_____C. spiral cleavage

__X__D. parapodia

_____E. triploblastic development

2.10 Which of the following is true about seminar receptacles?

_____A. are only found in hermaphrodite animals

_____B. are part of the male reproductive system

__X__C. store sperm prior to fertilization of the egg

_____D. store sperm prior to mating

2.11 The outer most layer of a nematode body is:

_____A. ciliated epidermis
__X__B. a collagenous cuticle
_____C. a chitinous cuticle
_____D. a syncytial tegument
_____E. a nonciliated epidermis

2.12 Among molluscs, extension of body structures such as tentacles is accomplished by

__X__A. hydrostatic skeleton.

_____B. special extensor muscles.

_____C. tendons and ligaments.

_____D. a system of levers.

_____E. muscles and levers.

2.13 Which of the following are not metamerically arranged in an annelid:

_____A. ganglia
__X__B. typhlosole
_____C. circular muscle
_____D. setae
_____E. metanephridia

2.14 Which of the following is a pseudocoelomate triploblast

_____A. garden snails

_____B. bryozoans

__X__C. round worms

_____D. earthworms

_____E. there is no such thing as a pseudocoelomate triploblast

2.15 The modified larval stage of some freshwater bivalves is called the

__X__A. glochidium.

_____B. trochophore.

_____C. pilidium.

_____D. dipleurula.

_____E. planula.

2.16 In earthworms, this muscular pump is used for ingesting food.

_____A. prostomium

__X__B. pharynx

_____C. clitellum

_____D. esophagus

_____E. mouth

2.17 The muscular, grinding structure of the earthworm digestive tract is the

_____A. gastric mill.

_____B. pharynx.

_____C. crop.

__X__D. gizzard.

_____E. stomach.

2.18 In the earthworm, the typhlosole

_____A. is the organ of locomotion.

__X__B. increases the absorptive area of the gut.

_____C. grinds the food.

_____D. produces secretions during mating.

_____E. coordinates the contractions of the digestive system.

2.19 Pigment cells of cephalopods like the squid are called

_____A. pinacocytes.

_____B. odontophores.

__X__C. chromatophores.

_____D. erythrocytes.

_____E. nautilophores.

2.20 Where would you locate the coelomic cavity when dissecting a mollusc such as a clam?

_____A. The coelom is between the mantle and the shell.

_____B. The coelom is all of the area enclosed by the two shells and exposed when you open the shell.

__X__C. The cavity around the heart forms the limited coelom.

_____D. The cavities inside the siphons are the coleomic cavity.

_____E. There is no coelomic cavity molluscs have a haemocoel.

2.21 The shell of a mollusc is secreted by the

_____A. radula.

__X__B. mantle.

_____C. periostracum.

_____D. foot.

_____E. visceral mass.

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25 pts Part 3: Complete the following sentences using the appropriate terms. Place the term in the space in the sentence or at the end of the sentence.

3.1 Marine worms, polychaetes, and earthworms have these but leeches don't. **Setae/Parapodia**

3.2 Any part of the digestive tract involved in storing food prior to digestion; it's particularly large in leeches. **Crop**

3.3 An earthworm's sperm is stored in the this prior to mating (Two words). **Seminal vesicles**

3.4 Nematodes have this type of a digestive system. **Complete**

3.5 The material that flows through a pneustome (pneumatostome) of a snail. **Air**

3.6 Once the food has been sorted in a mollusc, it passes into this structure to be biochemically broken down (two words). **Digestive gland**

3.7 When the circular muscles in an earthworm segment contract the segment does this. **Lengthens/elongate**

3.8 These cover the surface of a bryozoan's tentacles. **Cilia**

3.9 This opening is found in the pygidium of an annelid. **Anus**

3.10 The number of muscle layers in a nematode. **One**

3.11 Marine worms don't have these permanent organs; instead, they develop seasonally on the septal walls. **Gonads**

3.12 Another name for a bryozoan colony. **Zoarium**

3.13 In clams, the heart wraps around this as it passes through the pericardial cavity. **Intestine**

3.14 Most bryozoans species live in this environment. **Marine**

3.15 The tremendous array of molluscan body plans is an excellent example of this type of radiation. **Adaptive**

3.16 Bryozoans get their common name from these plants, which they look like. **Moss/Bryophytes**

3.17 The oldest part of the bivalve clam shell. **Umbo**

3.18 This fluid-filled cavity forms the hydrostatic skeleton of a nematode. **Pseudocoelom**

3.19 The brain of most molluscs resembles this because it surrounds the esophagous. **Ring**

3.20 Although this is the most anterior part of an annelid, it's not a true segment. **Prostomium**

3.21 The number of pairs of testes in an earthworm. **Two**

3.22 The innermost layer of the mollusc shell **Nacreous**

3.23 Every bryozoan colony starts from one of these. **Ancestrula**

3.24 This fluid-filled cavity forms the hydrostatic skeleton of a nematode. **Pseudocoelom**

3.25 In leeches, the coelomic cavity has been reduced to spaces referred to as these. **Sinuses**

24 pts Part 4: Answer 4 of the following 8 questions in the space provided. Each is worth 6 points. Do and extra question for a 6 point bonus.

5.1 What are parapodia, where would you find them and what do they do?

{On Marine worms/polycheates}{Fleshy extensions/lateral body wall}{Bundles of setal hairs}{used in locomotion/walking or swimming}{important as gas exchange surface}{two lobes/neuropodium and notopodium}{Internal aciculum/chitinous rod supports/has own musculature – something about how the movements are produced} First must be there for one point any of the others up to a total of six

5.2 Briefly describe ONLY three modifications of the ancestral molluscan traits that have allowed the squid to be an active predator.

Any of these for two point each for a total of six points In the explanation there must be a statement of what was the primitive or ancestral condition and what was the improvement This means that each {} is two points one for ancestral and one for the derived.

A) circulatory system{Open circulatory system of blood vessels has been replaced with a closed circulatory system} {Ancestral system had a single heart and this has been replaced with three}
B) digestive system {Instead of a single digestive gland the gland has become specialized with liver and caecum or }{Radula still present but there is a beak/jaw to rip and tear food}{foot changes from being used for locomotion to be tentacles for capturing prey}
C) improved nervous system {ganglia fused into a brain – ancestrally gangia were in different regions of the body}
D) {improved sensory system} {simple eyes to complex camera eye}
E) {improved locomotion}{discard ancestral shell and foot as way of moving and use the mantle to pump water for movement}

5.3 Compared to how the human body functions, and that of most animals, nematodes do things differently. Give three examples.

Any of these three examples must have normal and what is weird in the nematodes to get the full points

A) Sperm mobility {In animals usually flagellum for movement in nematodes is amoebic}
B) Body wall {In animals two muscle layers of circular and longitudinal in nematodes there are only longitudinal muscles
C) Male reproductive system {in most animals there are paired testes in nematodes there is only one
D) Muscle innervation {in most animals the nerve cord extends axons to innervate the muscles of the body wall in nematodes extensions of the muscle cell connect to the nerve cord}

5.4 The clitellum is found in the clitellates. What Phylum are they and what does the clitellum do?

{Annelida is the phylum} {Region of glandular cells on the body wall of the worm}{secretes mucous}{mucous binds the two worms together during mating}{secretion that travels from clitellum and has eggs/sperm and nutrients placed inside – something about how the clitellum produces the cocoon} {produces the cocoon} One point each

5.5What is a polypid, who has one and what does it do?

{Polypides are found in the Bryozoa}{One of two parts of the body}{of the zooid – this is an extra point if they use the term zooid rather than body or that they explain that individual body is the polypide}{Other than the body wall this is the functional animal: excretion, reproduction digestion etc}{Includes the lophophore} {Also the digestive system and other parts of the internal organ systems.} One point each.

5.6 How does a clam dig into the sediments?

{Using its foot}{and its shell}{Foot extends into the sediments}{swells at tip to anchor}{foot retractor muscles pull animal down into the sediments}{shell opens and closes to dig down and into the sediments}{shell opens to anchor as the foot digs deeper}. Most students won't include the role of the shell or won't explain it properly so they only need six of the {} to get the full marks for the question.

5.7 What is a tripartite coelom, how does it form and give an example of a phylum of animals that has one.

{A coelom with three parts}name the parts properly and know the sequence {anterior protocoel} {middle mesocoel} and {posterior metacoel} {forms by enterocoely/pockets of mesoderm arise from the gut/primitive gut}{Bryozoa but could include Echinodermata or Chordata but not Vertebrata since this is a subphylum}

5.8 What is the crystalline style and what does it do to aid digestion in the molluscs that have one?

{solid rod}{inside style sac}{spins to wind in the mucous string of food}{grinds against gastric shield}{Releases enzymes to dissolve the mucous string}{a statement that it frees up the particulate food to be available for sorting/into digestive gland}

Anything below this line will not be marked