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**RAJARATA UNIVERSITY OF SRI LANKA**  
**FACULTY OF APPLIED SCIENCES**  
**B.Sc. (General) Degree in Applied Sciences**  
**First Year – Semester I Examination – June/July 2018**  
**ZOO 1201 – INVERTEBRATE DIVERSITY**

**Index Number:**

**Time: Two (02) hours**

**This question paper consists of sections A, B and C. Answer ALL questions in section A and B and ONE (01) question from section C.**

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|-----------------------|------------|------------|------------|------------|-------|
| Marks                 |            |            |            |            |       |
| Question 1            | Question 2 | Question 3 | Question 4 | Question 5 | Total |
|                       |            |            |            |            |       |

**Section A: Multiple choice questions (40 minutes)**

1. Underline the **most suitable** option using a pen.

a) A statocyst is a structure that is involved in

- I. movement
- II. maintaining balance
- III. prey capture
- IV. digestion

b) Which of the following are coelomate animals

- I. porifera, platyhelminthes, nematoda
- II. annelida, molusca, cnidaria
- III. mollusca, annelida, nematoda
- IV. annelida, mollusca, arthropoda

- c) In a leuconoid sponge, the choanocytes are found in the
- I. flagellated chambers.
  - II. radial canals.
  - III. incurrent canals.
  - IV. excurrent canals.
- d) Metameric segmentation is a
- I. condition of being made up of serially repeated body parts.
  - II. condition of being made up of distinct body segments.
  - III. condition of being made up of fused body segments to form distinct regions.
  - IV. condition of being made up of highly similar segments.
- e) Classification is called a natural system because organisms are grouped based on their
- I. overall similarities
  - II. overall dissimilarities
  - III. evolutionary relationships
  - IV. natural similarities
- f) A monophyletic clade contains a group of organisms that include
- I. ancestors and some of its descendants.
  - II. ancestors and all of its descendants.
  - III. common ancestors and some of its descendants.
  - IV. common ancestor and all of its descendants.
- g) Triploblastic animals have
- I. a body cavity lined by the endoderm
  - II. three cell layers in the body
  - III. three germ layers during the formation of the blastula
  - IV. three distinct segments in the body
- h) Which of these are true about holometabolous development?
- A. It involves the stages of eggs, larvae, pupae and adults.
  - B. It reduces the predation of larvae by adults.
  - C. It reduces intraspecific competition between larvae and adults.
  - D. It involves the stages of eggs, nymphs and adults.
- I. A only
  - II. B only
  - III. A and C
  - IV. B and D
- j) The body of a typical mollusc consists of
- I. head, foot, tentacles and visceral mass
  - II. head, foot, mantle cavity and visceral mass
  - III. head, foot, mantle and visceral mass
  - IV. head, foot, shell and mantle cavity

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- k) The most likely reason for cephalopods to have a closed circulatory system would be to support their
- I. complex body organization
  - II. complex reproductive behaviour
  - III. rapid body colour changes
  - IV. active life style
- l) Phylum mollusca can be distinguished from other invertebrates by the presence of
- I. bilateral symmetry and an exoskeleton
  - II. a mantle and gills
  - III. a shell and non-segmented body
  - IV. a mantle and non-segmented body
- m) All of the following groups are members of the subphylum Crustacea except
- I. malacostraca
  - II. decapoda
  - III. branchiopoda
  - IV. pycnogonida
- n) The non-living exoskeleton inhibits growth in arthropods. To cope with this situation, the process arthropods use to shed the old exoskeleton is
- I. ecdysis
  - II. metamorphosis
  - III. tagmatization
  - IV. shedding
- o) The characteristics of four pairs of walking legs, a pair of pedipalps, and no mandibles or antennae are present in which of the following?
- I. Chelicerata
  - II. Myriopoda
  - III. Hexapoda
  - IV. Pycnogonida
- p) The crustaceans are the only arthropods with
- I. head, thorax, and abdomen
  - II. two pairs of antennae
  - III. mandibles
  - IV. biramous appendages
- q) The cartilaginous portion of the radula that supports the teeth in molluscs is called the
- I. spicule
  - II. visceral mass
  - III. teeth
  - IV. odontophore

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- r) The structures that keep the body surface clean of debris in echinodermites are called
- I. madreporites.
  - II. dermal branchiae.
  - III. lateral podia.
  - IV. pedicellariae.
- s) Two functions of the tree-like structure in the coelom of holothuroideans that is connected to the cloaca are
- I. respiration, excretion.
  - II. excretion, digestion.
  - III. digestion, circulation.
  - IV. circulation, respiration.
- t) Which part of the body is rotated during the process of torsion in gastropods?
- I. surface
  - II. mantle
  - III. viscera
  - IV. tentacles
- u) Mouthparts of an insect typically contain
- I. labium, tergum, mandibles, and maxillae.
  - II. tergum, labrum, mandibles, and maxillae.
  - III. pleura, labium, mandibles, and maxillae.
  - IV. labrum, mandibles, maxillae, and labium.

(80 marks)

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**Section B: Structured Essay Questions (50 minutes)**

Answer all sections only in the space provided.

2.

- a) State the minimal requirement to form a complete digestive tract.

.....  
 .....

(4 marks)

- b) Give two phyla with incomplete digestive tracts and two phyla with complete digestive tracts?

Incomplete digestive tract: .....

.....

Complete digestive tract: .....

.....

(8 marks)

- c) Describe briefly the disadvantages of having an incomplete digestive tract.

.....  
 .....  
 .....  
 .....  
 .....

(8 marks)

- d) Draw a labeled diagram of the digestive tract of an earthworm.

(10 marks)

e) State the function of each region of the digestive tract in the earthworm?

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.....

.....

(20 marks)

f) Explain why this is a more efficient system in comparison the incomplete digestive tract.

.....

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.....

.....

(12 marks)

(Total: 60 marks)

3.

a) Describe the difference between a diploblast and a triploblast.

.....

.....

.....

(8 marks)

b) State the names of the germ layers in the blastula of diploblasts and a triploblasts.

Diploblast: .....

.....

Triploblast: .....

.....

(10 marks)

c) Give two phyla that show diploblasty and two phyla that show triploblasty.

Diploblasty: .....

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Triploblasty:.....  
.....

(8 marks)

d) Write the respective germ layer that gives rise to the following regions of the body of a triploblast.

Body wall:.....  
Coelom lining:.....  
Gut wall:.....

(6 marks)

e) Deuterostomes and Protostomes are the two main groups of triploblasts. Provide two representative phyla for each group.

Deuterostomes:.....  
.....  
Protostomes:.....  
.....

(8 marks)

f) Draw a labelled diagram of a gastrula.

(10 marks)

g) Briefly describe the fate of the blastopore in deuterostomes and protostomes.

.....  
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.....  
.....  
.....

(10 marks)

(Total: 60 marks)

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**Section C: Essay questions** (30 minutes)

- 4.
- a) Describe the characteristic features of nematodes.
  - b) Write a comparative account on the life cycle of two parasitic nematodes that infect humans.
- (100 marks)
5. Arthropods are one of the most successful groups of invertebrates. Discuss the adaptations and features that made this group highly successful.
- (100 marks)

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