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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 – May 2022

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 TWO (02) questions from section C.

For official use Only						
Marks						
Question 1	Question 2	Question 3	Question 4	Question 5	Question 6	Total

Section A: Multiple choice questions (20 minutes)

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

a) Which pair of organisms shows a cellular-tissue grade of body organization?
   i. *Taenia, Cestum*
   ii. *Hydra, Sycon*
   iii. *Physalia, Taenia*
   iv. *Obelia, Pleurobrachia*

b) Polarity is the
   i. division of the body into a series of repetitive segments.
   ii. localization of sensory organs in the anterior end of the body.
   iii. differentiation along an anterior posterior axis.
   iv. serial repetition of similar segments along an anterior-posterior axis.

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c) Modern classification also referred to as a 'natural system' groups organisms based on
   i. shared features
   ii. unique features
   iii. evolutionary relationships
   iv. genetic similarity

d) A schizocoelous coelom is formed by
   i. splitting of the mesodermal embryonic tissue.
   ii. splitting of the endodermal embryonic tissue.
   iii. splitting of the ectodermal embryonic tissue.
   iv. the pouches of split mesodermal embryonic tissue.

e) The cytostome of protistans is a specialized structure used for
   i. osmoregulation.
   ii. prey capture.
   iii. feeding.
   iv. reproduction.

f) *Trypanosoma,* which causes the disease sleeping sickness in humans, belongs to the phylum
   i. Dinoflagellata
   ii. Zooflagellata
   iii. Apicomplexa
   iv. Sarcomastogophora

g) Which of the following statements are true about the amoeboid cells that move about in the mesohyl of poriferans?
   A. They phagocytise particles.
   B. They receive particles from choanocytes.
   C. They can differentiate into other types of specialized cells.

   i. A only
   ii. B only
   iii. A and B only
   iv. A, B and C

h) Which of the following is/are true about reproduction in cnidarians?
   A. They only show sexual reproduction.
   B. Fertilization is external.
   C. Gametes are formed during sexual reproduction.
   D. The free-living larval stage is known as parenchymula.

   i. A only
   ii. B only
   iii. B and D
   iv. B and C

j) Which one of the following characteristics is shared by both calcarea and hexactinellida?
   i. Canal system
   ii. Six rayed siliceous spicules
   iii. Glass like body structure
   iv. Funnel shaped body form

k) Which one of the following is **not** be a benefit of having a true coelom?
   i. Provision of space of visceral organs.
   ii. Exposure of more cells for surface exchange.
   iii. Provision of symmetry to the body.
   iv. Serves as a hydrostatic skeleton.

l) Which one of the following pairs use nephridia as their excretory organ?
   i. Platyhelminthes – Arthropoda
   ii. Mollusca – Annelida
   iii. Echinodermata – Nematoda
   iv. Arthropoda – Ctenophora

m) One of the features you can use to distinguish the classes of phylum Annelida is:
   i. presence of setae and parapodia
   ii. presence of clitellum
   iii. presence of external segmentation
   iv. presence of suckers

n) Common feature of arthropods and nematodes is:
   i. having segmented bodies
   ii. having thick cuticle
   iii. having both circular and longitudinal muscles
   iv. having compound eyes

o) The Aristotle lantern is present in:
   i. sand dollar
   ii. sea lily
   iii. bristle star
   iv. sea star

p) Select the **incorrect** statement.
   i. Book lungs are present in scorpions.
   ii. Crustaceans have two pairs of mandibles and a pair of antennae.
   iii. The insect body is divided into three tagma.
   iv. Subphylum chelicerata includes animals with eight legs.

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q) Which statement is true about molluscs?
i. They all have an open circulatory system.
ii. All molluscs have shells.
iii. All have a mantle.
iv. All have a muscular foot.

r) Select the class that shows the following features:
A) Close ambulacral groves
B) No pedicellaria
C) Tube feet without suckers

i. Ophiuroidea
ii. Asteroidea
iii. Crinoidea
iv. Holothuroidea

s) Parapodia are
i. used primarily for locomotion.
ii. present in Oligochaeta.
iii. the main respiratory organ.
iv. present in all annelids.

t) Select the correct pair.
i. Insecta-spider
ii. Diplopoda – centipede
iii. Merestomata - horseshoe crab
iv. Malacostraca - barnacles

u) What is the function of Tiedmann's bodies?
i. produce mucus for locomotion
ii. produce coelomocytes and amoeboid cells to protect the animal
iii. produce toxic substances that is use to capture the prey
iv. there is no special function; it is a cell present in molluscs

(80 marks)

Section B: Structured Essay Questions (40 minutes)
Answer **ALL** sections **only** in the **space provided**.

2.

a) Single cellular organisms, such as protistans, do not have a nervous system. Explain how they can live without a nervous system.

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(06 marks)

b) Sometimes, multicellular animals do not have a nervous system. Giving an example, explain how such animals are capable of surviving without a nervous system.

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(06 marks)

c) Describe what a nerve net is and name two phyla in which nerve nets form the nervous system.

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(10 marks)

d) Describe the mode of life, type of movement and types of responses to stimuli by animals with nerve net type of nervous system.

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(06 marks)

e) Draw and label the basic structure of the nervous system of flatworms.

(10 marks)

f) Explain how the nervous system of flatworms is more efficient at receiving and processing signals in comparison to nerve nets.

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(12 marks)

g) Cephalization is a phenomenon shown by flatworms and many other groups of invertebrates. Describe what cephalization is and explain why it is usually seen in organisms with directional movement.

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(10 marks)

(Total: 60 marks)

3.

a) Name the phylum, respiratory structures of following organisms and state **one (01)** feature that makes the named respiratory structure function efficiently.

Organism	Phylum	Respiratory structure	Special feature of respiratory structure which increases efficiency
Chiton			
Spider			
Earthworm			
Grasshopper			

(16 marks)

b) State **two (02)** external features of chiton that is characteristic to the phylum.

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(06 marks)

c) Briefly explain the term "torsion".

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(06 marks)

d) Name the class that shows torsion.

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(02 marks)

e) State **two (02)** features that are present in the digestive system of the animals belonging to the class that you have mentioned above 3d).

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(06 marks)

f) A student grouped octopus and sea star into the same class on the basis of external features. State **two (02)** external features that may have led the student to classify them into one group.

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(08 marks)

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h) State **four (04)** characters for each of the two animals that could assist with grouping them into two different classes.

Sea star	**Octopus**

(12 marks)

g) Write **two (02)** economic importances of the phylum Mollusca, giving a suitable example for each.

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(04 marks)

(Total: 60 marks)

Section C: Essay questions (60 minutes)

4.

a) Describe the basic structure and histology of the body wall of flatworms. **(40 marks)**

b) Certain parasitic flatworms have very complex life cycles. Justify this statement using 3 examples. **(60 marks)**

5. a) Tabulate the distinguishing features of earthworm and tapeworm body segmentation.
(20 marks)

b) Compare and contrast the major characteristics of Annelida with that of Nematoda.
(80 marks)

6. Write short notes on the following.
   a) Radial symmetry
   b) Apicomplexa
   c) Subphylum Myriapoda
   d) Structure of molluscan shell

(100 marks)

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