Tutorial Letter 201/1/2016

Animal and Plant Diversity
BLG1502

Semester 1

Department of Life and Consumer Sciences

IMPORTANT INFORMATION:
This tutorial letter contains important information about your module.
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1 INTRODUCTION

Dear Student

Welcome once again as a biology student to the Department of Life and Consumer Sciences. We trust that you have been enjoying your studies with Unisa so far and that you are finding this semester stimulating and rewarding. Since you have been attempting activities from your Module Online (MO001) document as well as those in the prescribed textbook, you have undoubtedly learned a great deal and improved your vocabulary towards biology terms and concepts.

As it has been the case throughout the semester, I (the lecturer) and the staff (including e-tutors) of the Life Sciences section of the Department of Life and Consumer Sciences will gladly assist you, and you are welcome to contact us if any questions or problems arise during your preparation for your BLG1502 examination.

Worthy of note is that this tutorial letter encompasses feedback on both Assignments 01 and 02 as well as May/June 2016 examination guidelines. This document consists of 11 pages.

2 PURPOSE OF AND OUTCOMES FOR THE MODULE

2.1 Purpose

The purpose of the learning is to acquire the requisite knowledge and skills to meet the enormous challenges and opportunities presented by life sciences on the African continent and elsewhere on the planet.

2.2 Outcomes

You should be able to:

- describe the structure, composition and function of a prokaryotic cell wall
- make a flow diagram of the life cycles, indicating the gamete and sporophyte generations
- identify and discuss the structure of the three basic organs of a plant body, namely the roots, stems and leaves
- describe the characteristics of three tissue systems that the organs are composed of, namely dermal, vascular and ground tissue
- describe the two-host life history of *apicomplexans*
- define and name the classes of essential nutrients
- understand the major functions of the organs that make up the mammalian digestive system

3 LECTURER AND CONTACT DETAILS

All queries that are not of a purely administrative nature, but are about the content of this module should be directed to us. Please have your study material with you when you contact us.

Mr AR Mudau
B-Block, Room 240B
4  PRESCRIBED BOOKS


5  CONCLUSION

To this end, it has been exciting to have you as student for the module BLG1502. It is believed that you have submitted both your assignments and your cooperation is highly appreciated in this regard. If you are uncertain about anything that is enclosed in this document, please do not hesitate to contact the lecturer for further clarity. It is of paramount importance that you refer answers to the prescribed textbook for further understanding, as the memoranda are prepared to guide you on how to approach the diversity of biological questions. Moreover, you are strongly discouraged to memorise the provided assignment answers without a depth understanding.

6  ADDENDUM

Assignment 01 and 02 feedback

May/June 2016 examination guidelines
Question 1:
3. infer the structure of a bacterial wall and bacterial response to antibiotics

Question 2:
5. alternation of generations

Question 3:
2. kingdom, phylum, class, order, family, genus, species

Question 4:
5. seeds and pollen

Question 5:
5. All of these are correct.

Question 6:
4. protein in muscle cells

Question 7:
2. can be made by the animal's body from other substances

Question 8:
4. Folic acid deprivation is associated with neural tube abnormalities in a fetus.

Question 9:
4. absorption

Question 10:
4. vena cava → right atrium → ventricle → pulmonary circuit

TOTAL: 20 marks

End of Assignment 01 memorandum (semester 1)
Question 1  
[5 x 1 = 5 marks]  
1.1 Mixotroph (1)  
1.2 Endodermis (1)  
1.3 Bioremediation (1)  
1.4 Carpel (1)  
1.5 Charophyte (1)

Question 2  
[17 marks]  
2.1 Any six of the following points: (6 marks)  

The two-part format of the scientific name (1), commonly called a binomial, was instituted in the 18th century by Carolus Linnaeus (1). The first part of a binomial is the genus to which the species belongs (1). The second part, called the specific epithet (1), is unique for each species within the genus. The first letter of the genus is capitalised (1) and the second part is written with a lowercase letter (1), and both name parts are either underlined or italicised (1).

2.2 Either way round, but in the same sequence (6 marks)  

Kingdom→Phylum→Class→Order→Family→Genus→Species  
Species→Genus→Family→Order→Class→Phylum→Kingdom

2.3 Name the five characteristics that define land plants (5 marks).  

- Alternation of generations (1)  
- Multicellular, dependent embryos (1)  
- Walled spores produced in sporangia (1)  
- Multicellular gametangia (1)  
- Apical meristems (1)

Question 3  
[16 marks]  

You are encouraged to gather more information (from the prescribed book, page 979 to 981) for this question as the given answer below is meant to guide you on how to answer this question. Moreover, mark allocation is your main guide on how many points are needed.

a) Essential amino acids  
- responsible for the building and repair of body tissues

b) Essential fatty acids  
- increase the absorption of fat-soluble vitamins including vitamins A, D, E and K

c) Vitamins  
- Vitamin C is necessary for the synthesis of collagen.  
- Vitamin D helps to maintain calcium homeostasis.
- Vitamin K plays an important role in blood clotting.

d) Minerals
- Calcium helps in bone and tooth formation, blood clotting, nerve and muscle function.
- Sodium helps to maintain fluid volume outside of the cells and helps cells to function normally.

Question 4

It is encouraged that you re-draw diagrams, especially life cycles, as such practice will brighten up your understanding and when questions that are more related (to this) are asked in the examination paper, you do not struggle to recall the information. Remember the purpose of this kind is not set to test your drawing skills but to test your understanding of life cycle with the aid of demonstrations.
Any five of the following modified roots:

<table>
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<tr>
<th>Modified root name</th>
<th>Function</th>
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<tr>
<td>1. Prop roots (1)</td>
<td>✓ Support the tall, top-heavy tree (1)</td>
</tr>
<tr>
<td>2. Storage roots (1)</td>
<td>✓ To store water and food (1)</td>
</tr>
<tr>
<td>3. Strangling aerial roots (1)</td>
<td>✓ To anchor on other trees (1)</td>
</tr>
<tr>
<td>4. Buttress roots (1)</td>
<td>✓ Give architectural support to the trunks of such trees (1)</td>
</tr>
<tr>
<td>5. Pneumatophores (1)</td>
<td>✓ Enable the root system to obtain oxygen (1)</td>
</tr>
<tr>
<td>6. Contractile roots (1)</td>
<td>✓ Pull the plant a little deeper into the soil (1)</td>
</tr>
<tr>
<td>7. Parasitic roots (1)</td>
<td>✓ Penetrate the host plants and withdraw nutrients (1)</td>
</tr>
</tbody>
</table>

Question 6

a) **Dermal tissue system**: is the outer protective layer which covers the entire body of a plant. It protects the organ (leaf/stem/root) against physical damage, desiccation and pathogenic organisms. The dermal tissue of non-woody plants usually consists of a single layer of tightly packed cells called the epidermis. In woody plants, the epidermis is replaced by the periderm, which mainly consists of non-living cork cells.

b) **Vascular tissue system**: consists of two vascular tissues, that is, the xylem and phloem that are responsible for carrying out long-distance transport of materials between roots and shoots. It is continuous throughout the plant but is arranged differently in each organ. The xylem conveys water and minerals upwards from roots to shoots and the phloem transports organic nutrients from where they are made to where they are needed. The xylem is composed of tracheids and vessel elements, the latter occurring in most flowering plants and some gymnosperms. Both the tracheids and vessel elements are dead at maturity.

c) **Ground tissue system**: consists of tissues that are neither dermal nor vascular. It includes the parenchyma, collenchyma and sclerenchyma tissues that are specialised for functions such as storage, photosynthesis and support. The pith is the ground tissue found internal to the vascular tissue while the cortex is external to the vascular tissue.

Question 7

7.1 Homeostasis means “steady state”, referring to the maintenance of internal balance. In achieving homeostasis, animals maintain a relatively constant internal environment even when the external environment changes significantly. For example, the human body maintains a fairly constant temperature of about 37 °C (98.6°F) and a pH of the blood and interstitial fluid within 0.1 pH unit of 7.4 (Remember: you may always add information related to homeostasis to gain full mark in this question.) (6 marks)
7.2 Antibody is a protein secreted by plasma cells (differentiated B cells) that binds to a particular antigen; also called immunoglobulin. All antibodies have the same Y-shaped structure and in their monomer form consist of two identical heavy chains and two identical light chains. (2½ marks)

Antigen is any substance that elicits an immune response by binding to receptors of B cells, antibodies, or of T cells. Antigens are usually foreign and are typically large molecules, either proteins or polysaccharides. Many antigens protrude from the surface of foreign cells or viruses. (2½ marks)

7.3 Any **TWO** of the below functions:

- Transmit signals between different parts of the body.
- Regulates certain body processes, such as blood pressure and the rate of breathing.
- Connect the brain and spinal cord with muscles and sensory receptors in the skin. (2 marks)

**Question 8** [9 marks]

The open circulatory system is the system where the circulatory fluid bathes the organs directly (1). In these animals, the circulatory fluid called hemolymph is also the interstitial fluid that bathes body cells (1). The contraction of one or more hearts pump of the hemolymph through the circulatory vessels into the interconnected sinuses, that is, the spaces surrounding the organs (1). Arthropods and most molluscs are examples of this system (*must mark for a correct example*).

The closed circulatory system is the system in which a circulatory fluid called blood is confined to vessels and is distinct from interstitial fluid (1). One or more hearts pump blood into large vessels that branch into smaller ones that infiltrate the organs (1). These animals include annelids, cephalopods and all vertebrates (*must mark for a correct example*).

**Common to both:**
- Circulatory fluid/blood (1)
- Set of tubes/blood vessels (1)
- Muscular pump/heart (1)

**TOTAL: 100 marks**

End of Assignment 02 memorandum (semester 1)
1. Introduction

Dear Student

You have progressed to the stage of summative assessment for the module BLG1502. This tutorial letter (TUT 201) provides you with useful examination guidelines to follow as you prepare for the upcoming examination. You are assured that the summative assessment (examination) you are preparing for, is not a deliberate attempt to fail you. It has been put in place for you to confirm your competence of the module and how well you have mastered the outcomes of the module. You are encouraged to prepare yourself for the upcoming assessment opportunity as this will be your key to successfully completing the module.

2. Outcomes of module

Please visit Tutorial Letter 101 for the outcomes of this module.

3. Format of summative assessment

This is a formal sit-down examination.

4. Compilation of summative assessment

The question paper is a two-hour paper, which consists of a total of 100 marks.
All questions must be answered.
Drawings should be done with a pencil (preferably HB pencil).
Question 1: This consists of multiple-choice questions only.
Question 2: This question requires you to give the correct scientific term.
Question 3: This consists of a “list” question.
Question 4: It is a mixture of questions that include instructions like “compare” and “name”.
Question 5: This consists of a “distinguish and name” question.
Question 6: This consists of a “distinguish and describe” question.
Question 7: This question requires you to provide a labelled diagram of a particular life cycle, and also to include blocks of information to explain each stage.
Question 8: It requires you to name things.

5. How to answer questions

Number your questions correctly as stated in the exam paper. Give answers that are relevant to what is asked by the question.
Question type: “Distinguish between” or “differentiate between” means you should give the difference between the two concepts or things.
“Distinguish among” means you must give differences among several concepts or things (usually more than two).
“Describe” means your definition of a concept or thing in detail.
“Briefly describe” means a short description of a concept or thing.
“Compare” means you must articulate differences of the concepts. (It is ideal to always compare in a tabular form.)

6. Use of previous examination papers

It is advisable that you use assignments and previous examination papers for BLG1502 to test yourself. However, questions such as those in previous examination papers may not necessarily be asked in the examination. These questions only serve as a guide to determine if you have prepared well enough to successfully complete the summative assessment. Previous examination papers will also assist you in testing your competence in answering different types of questions. Remember that the type of questions may be applied to different aspects of the work you have studied and will not only be applied to the particular piece of work used in the example question.

IMPORTANT: Study the prescribed chapters of the prescribed book AND also revise your assignments AND previous examination papers. Do not be selective in your preparation. PLEASE STUDY ALL PRESCRIBED SECTIONS MADE UP OF 12 LEARNING UNITS FROM THE MO001 DOCUMENT.

7. Release of examination results

You might be anxious to receive your marks after completing the first summative assessment opportunity in May/June 2016. You are reminded that Unisa will officially release the examination marks in July 2016. Marks may be released earlier if the assessment and moderation process has been fully completed and signoff could be granted before the official Unisa release date. Marks may not be released telephonically or via any other method of communication without official signoff by the executive dean.

8. Closing remarks

The examination guidelines for this module have been compiled to adequately assist you in preparing yourself for the coming summative assessment. You will successfully complete the assessment if you apply yourself and use the examination guidelines to assist in the preparation for the examination.

Good luck with the coming examination!

Lecturer,

Mr Ambani Mudau