

## FACULTY OF SCIENCE

## DEPARTMENT OF BOTANY AND PLANT BIOTECHNOLOGY

MODULE:	MCB2B01 PLANT PATHOLOGY
CAMPUS	APK
EXAM	NOVEMBER 2016

DATE:	24 NOVEMBER 2016	SESSION:	08:30 – 11:30
DURATION	3 HOURS	MARKS:	150 (SECTION A & B)
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INTERNAL MODERATORS:	DR L MOKAE DR E. VENTER		

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SECTION A	Water Borne Diseases (7 Questions)
SECTION B	Plant Pathology (11 Questions)

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INSTRUCTIONS:      ANSWER ALL THE QUESTIONS  
Answer Section A and B in separate answer books

NUMBER OF PAGES:      6 PAGES

**SECTION A – WATER BORNE DISEASES****QUESTION 1****[10]**

Write down the correct term for each of the following definitions. Only write the number and correct answer, e.g. 1. Animalia.

- 1.1 The intermediate host for *Schistosoma japonicum*'s miracidia larvae.
- 1.2 The ingestion of red blood cells by *Entamoeba histolytica*.
- 1.3 This disease is asymptomatic in the beginning within the final host.
- 1.4 This mosquito species has a larvae with a backward "g" shaped form.
- 1.5 The structures used by *Diphyllobothrium* to attach to the wall of the definitive host's small intestine.
- 1.6 A parasite that infects a host other than its normal host.
- 1.7 In which structure will the larvae of *Wuchereria* complete its development in the mosquito?
- 1.8 A patient suffering from geophagy are exposed to *Ancylostoma* through this route.
- 1.9 The larval stage that forms once the cercariae penetrates its final host and loses its forked tail.
- 1.10 The class to which *Entamoeba* belongs.

**QUESTION 2****[8]**

While on holiday in Durban, you join some friends for lunch. The chef at the restaurant recommends the catch of the day. Once back in Johannesburg, you experience severe abdominal pain and intestinal obstruction. You now decide to visit your local GP, who further notices that you've lost some weight and appear to be anaemic.

- 2.1 What procedure will the GP follow to diagnose a possible disease/problem? (1)
- 2.2 Considering your answer in 2.1, what will the GP focus on during this procedure? (2)
- 2.3 Considering your answer in 2.2, what type of organism have you been exposed to? (1)
- 2.4 Give the scientific name for the above mentioned organism. (2)
- 2.5 What medication does the GP prescribe? (2)

**QUESTION 3****[13]**

People living in rural areas with little or no infrastructure are often exposed to communal bathrooms.

- 3.1 Give the general name for the organism that people can be exposed to. (1)
- 3.2 Considering your answer in 3.1, identify the different life stages present in the soil. (3)
- 3.3 Considering your answer in 3.2, indicate the approximate life span for the different life stages in the soil (indicate each life stage with its life span). (3)
- 3.4 Identify the disease that the definitive host will be exposed to. (1)
- 3.5 Give the scientific name(s) for the organism(s) responsible for this disease. (2)
- 3.6 Give the classification for the above mentioned organism(s) focussing specifically on the Superfamily and Family names. (3)

**QUESTION 4****[11]**

*Entamoeba histolytica*, a unicellular parasitic organism, when exposed to humans causes what is generally known as amoebiasis.

- 4.1 Identify the possible stages / progress of the disease in the definitive host. (6x½=3)
- 4.2 Considering your answer in 4.1, explain how these stages differ from one another. (6x½=3)
- 4.3 Explain possible ways that the definitive host can be exposed to this organism. (4x½=2)
- 4.4 Identify three (3) UNIQUE symptoms a definitive host may experience when exposed to this organism. (3)

**QUESTION 5****[11]**

*Wuchereria bancrofti* causes elephantiasis / filariasis in its definitive host.

- 5.1 Give the classification of the above mentioned organism, focussing specifically on: Order, Superfamily and Family. (3)
- 5.2 Identify the diagnostic stage of the disease in the definitive host. (1)
- 5.3 What outstanding feature does the diagnostic stage present? (1)
- 5.4 Identify the vector for this disease. (1)
- 5.5 How is the diagnostic stage transferred to the vector? (1)
- 5.6 What happens to the diagnostic stage once inside the vector? (4)

**QUESTION 6****[12]**

*Plasmodium vivax* lifecycle involves two (2) hosts. *Anopheles*, the vector and the definitive host, *Homo sapiens*.

- 6.1 Identify the different cycles within the definitive host. (2)
- 6.2 Which structure(s) is affected by the abovementioned cycles? (2)
- 6.3 What type of asexual reproduction is taking place during these cycles? (1)
- 6.4 What structure can give rise to the gametocytes? (1)
- 6.5 How is the vector exposed to the gametocytes? (1)
- 6.6 Explain sexual reproduction of *P. vivax* in the vector. (5)

**QUESTION 7****[10]**

People swimming in water infected with snails, have the possibility of being exposed to a *Schistosoma* sp. resulting in schistosomiasis or bilharzia.

- 7.1 What stage of the life cycle of *Schistosoma* sp. is considered to be the diagnostic stage? (1)
- 7.2 How would a medical practitioner go about to identify the specific disease in humans? (3)
- 7.3 How do the *Schistosoma* species differ from one another? (3)
- 7.4 Which *Schistosoma* species is responsible for urinary bilharzia and why? (3)

**TOTAL****END OF SECTION A****[75]**

**SECTION B – PLANT PATHOLOGY****Question 1****[4]**

Name the four main objectives of the Science of Plant pathology.

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**Question 2****[10]**

*Give the definitions for the following terms:*

- 1.1. Resistance {2}
- 1.2. Disease escape {2}
- 1.3. Epiphytotic disease: {3}

*Give the correct term for the following definitions:*

- 1.4. The growth of a pathogen from the point of entry to varying extents without showing adverse effect on tissues through which it passes. {1}
- 1.5. The ability of an organism to interact negatively with the physiology of the host. {1}
- 1.6. An organism that can live and multiply only on another living organism and always obtain their food from living tissues on which they complete their lifecycle. {1}
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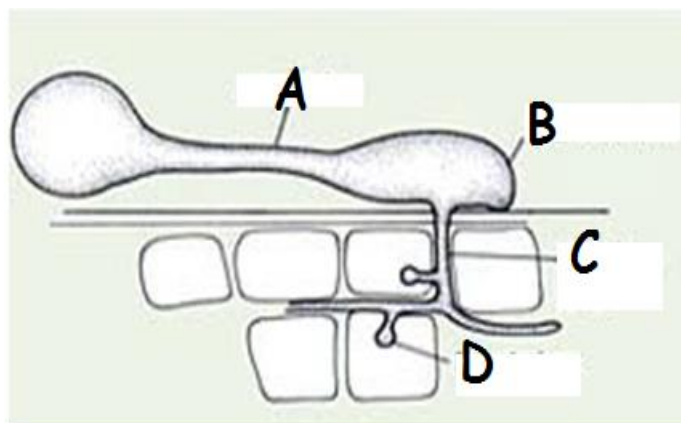
**Question 3****[2]**

How does the mode of nutrition in fungi differ from most other organisms?

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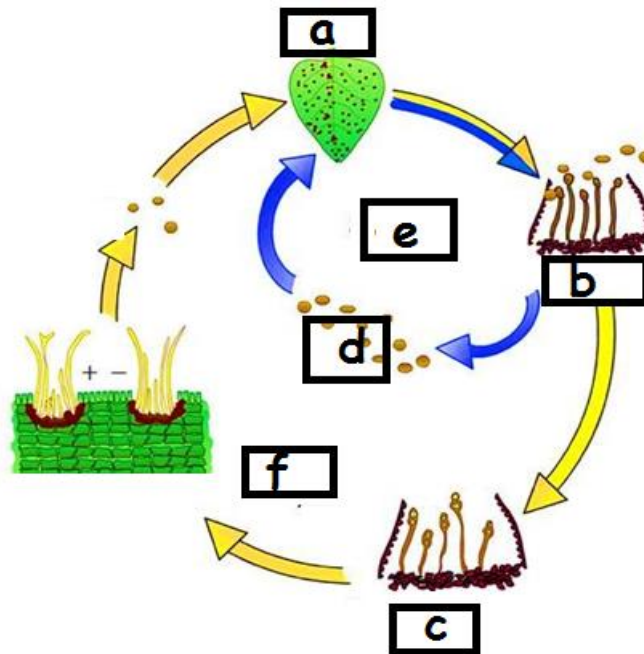
**Question 4****[10]**

- 4.1. Correctly label the following organs / parts on the diagram. {4}



4.2. Label the life cycle stages on the diagram.

{6}



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### Question 5

[8]

Draw and correctly label the Pathogenicity Triangle giving examples of each set of factors represented.

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### Question 6

[6]

Compare simple and complex forms of mechanical resistance presented by plants.

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### Question 7

[4]

Discuss "Plant antagonism" as an important expression of biological control.

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### Question 8

[10]

"Pre-existing structural defences assist in the protection of plants against the invasions of pathogens" Motivate this statement.

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### Question 9

[8]

Tabulate the four (4) main differences between the two main plant epidemic models.

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**Question 10****[7]**

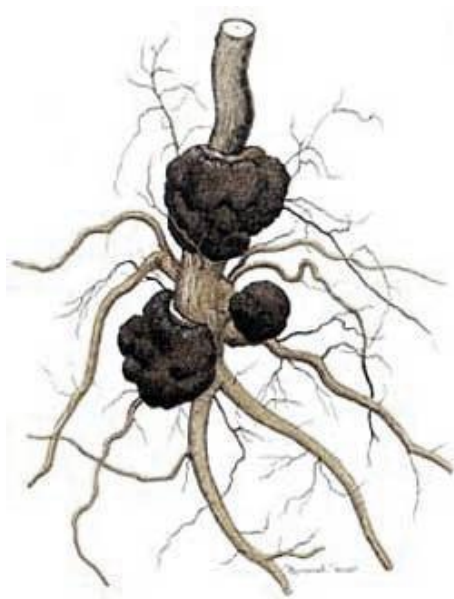
Plants defend themselves against pathogens with a combination of weapons from two arsenals. What are these arsenals and how do they assist plants in defending themselves?

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**Question 11****[6]**

Provide the scientific and generic names as well as the type of microorganisms that could have caused the following plant diseases.

2.1.



2.2.



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**TOTAL****END OF SECTION B****[75]**