

FACULTY OF SCIENCE

DEPARTMENT OF BOTANY AND PLANT BIOTECHNOLOGY					
MODULE:	MCB2B01 & MCB02B2 MICROBIAL DIVERSITY AND PLANT PATHOLOGY				
CAMPUS	АРК				
EXAM	NOVEMBER 2019				
DATE:	11 NOVEMBER 2019)	SESSION:	08:30 -	11:30
DURATION	3 HOURS		MARKS:	150 (SE	CTION A & B)
ASSESSORS:			DR L NEETHLING MR G TANIH		
INTERNAL MODERATORS:			DR G PAHAD		
			MRS R TON	3	
	SECTION A		Water Borne Diseases (5 Questions)		
	SECTION B		Plant Patholo	ogy	(4 Questions)
INSTRUCTIONS:	ANSWER <u>ALL</u> THE QUESTIONS Please use one colour book for Section A (Dr Neethling) and the other colour book for Section B (Mr Tanih)				
NUMBER OF PAGES:	7 PAGES				

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SECTION A – WATER BORNE DISEASES

QUESTION 1

A patient is diagnosed with Malaria by a small rural clinic in Mozambique. Identify the parasite that causes this disease (2). Describe the lifecycle with the aid of drawings (15). Describe the diagnostic techniques that would have been used by the medical staff at the clinic (5). [22]

QUESTION 2

If someone is diagnosed with Bilharzia, which parasite are they infected with? (2). Describe the lifecycle of this parasite (8). How does the lifecycle influence the pathogenicity? (6).

QUESTION 3

If someone visiting India is diagnosed with hookworm disease, what are the possible parasites that cause this disease? (4). Describe the lifecycle of these parasites with the aid of drawings (16). [20]

QUESTION 4

Describe the various methods one could be exposed to a waterborne pathogen with the use of examples.

QUESTION 5

Describe the various simple methods of testing for parasitic infection, using the parasites you studied during this course.

[9]

[75]

[8]

End Section A

SECTION SUBTOTAL

SECTION B – PLANT PATHOLOGY

Question 1

Multiple Choice: Write the correct answer corresponding to the question all the correct answers

1.1 Saprobes are essential to life on earth because they

- A. Grow in association with the roots of most plants, providing scarce minerals to the plants
- B. Are removers of debris that other organisms produce
- C. Are fungi that live on trees and particularly digest the sap in the phloem
- D. Recycle organic material to produce inorganic compounds
- E. Consume CO₂ which would otherwise build up to toxic levels (greenhouse gas)
- 1.2 Ascocarps may be
 - A. Present or absent in the Ascomycota
 - B. known as a cleistothecium
 - C. known as an apothecium
 - D. known as an acervulus
 - E. dicaryotic
- 1.3 Fungi are different from plants because
 - A. they lack organelles
 - B. they are unable to fix CO₂
 - C. they rely on absorptive nutrition
 - D. they are autotrophs

1.4 immitis is a dimorphic 'fungus' i.e. it can exist as molds in soil and spherule in tissues, hence termed as

- A. Diploid
- B. Diplococcus
- C. Dimorphic
- D. Polymorphic

1.5 Study of 'fungi' is called

- A. Virology
- B. Mycology
- C. Parasitology
- D. Immunology

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1.6 Fungi is categorized in two types i.e. 'yeasts' and

- A. Bugs
- B. Ticks
- C. Molds
- D. Algae

1.7 'fungal' cell membrane in contrast to human cell membrane is composed of

- A. Sterol
- B. Cholesterol
- C. Ergosterol?
- D. Lipids

1.8 Cell wall of 'fungi' is made up of

- A. Peptidoglycan
- B. Murine
- C. Chitin
- D. Cellulose
- 1.9 Fungi' are
 - A. Eukaryotic organisms
 - B. Prokaryotic organism
 - C. Unicellular
 - D. Algae

1.10 A network of fine white 'filaments' in vegetative part of fungus is called

- A. Septa
- B. Hyphae
- C. Mycelium
- D. Conidia

1.11 If you were a plant pathogen, what would be the first obstacle to invading a host plant that you would have to overcome?

- A. Chemical toxins on the surface of a plant
- B. Physical barriers on the exterior of a plant
- C. Immune proteins in the plant tissue
- D. All of the above

1.12 Fungal pathogens can enter their host by means of:

- A. Enzymes (cutinases)
- B. Mechanical Force (appresoria)
- C. Wounds, stomatal pores
- D. All of the above
- 1.13 Both induced and pre-existing mode of defences include structural and chemical defences
 - A. True
 - B. False
- 1.14 Which of the following does not act as a structural defence mechanisms?
 - A. Waxes
 - B. Epidermal cells
 - C. Cuticles
 - D. Tannis
- 1.15 Which of the following does not act as a histological defence structure?
 - A. Gum deposition
 - B. Tyloses
 - C. Cork layer
 - D. Pisatin
- 1.16 If a pathogen causes breakdown of the cell wall constitutes which subsequently leads to loss of tissue coherence, it is due to
 - A. Toxins
 - B. Antigens
 - C. Enzymes
 - D. None of these
- 1.17 Which of the following is not a hemicellulose enzyme?
 - A. Xlyanase
 - B. Arabinase
 - C. Galactanase
 - D. β- 1,4 endo-gluconases
- 1.18 If a pathogen kills the protoplast, it is due to the production of
 - A. Proteolytic enzymes
 - B. Toxins
 - C. Cellulases
 - D. Cutin esterase

MCB2B01 Question 2	11 NOVEMBER EXAM	2019 [21]
2.1 Draw an annotated diagram	of black bread mold and provide its scientific name	(6)
2.2 Asexual reproduction in fung	gi can occur in three ways. Name the ways.	(3)
2.3 Sexual reproduction in fung	i can occur in two ways. Name them	(2)
2.4 Matching: Place the correct	t letter from the right hand column by the correct phylum in the	left hand
column.		(3)
Ascomycota	a) Hyphae septate with simple septa, asexual spores are a sexual spores contained in a sac	conidia,
Zygomycota	 b) coenocytic hyphae, produce spore in sporangium, whic referred as zygospores 	h are
Basidiomycota	c) cellulose in cell walls, coenocytic hyphae, biflagellate zo	ospores
	d) Chitin in cell wall, septate hyphae, presence of basiodio basidium	spores in
2.5 Give the correct term for the	following definitions:	(7)
A. An organism that can live	e and multiply only on another living organism and always obt	ain their food
from living tissues on whi	ch they complete their lifecycle organism	
B. Non-infectious plant dis conditions are termed?	seases due to abiotic causes such as adverse soil and e	environmental
C. A disease usually occurs	s widely but periodically in a destructive form is referred as?	
D. The growth of a pathoge	en from the point of entry to varying extents without showing a	adverse effect
on tissues through which	it passes.	
 A pathogens that can grow the same plant 	ow on a living host but are also capable of growth on dead or dy	ving tissues of
F. A chain of events that le	ads to development of disease in the host.	
G. A set of varying symptom	s characterizing a disease.	
Question 3		[15]
3.1 When would a plant be cons	sidered "healthy"?	(5)
3.2 Describe three ways through	n which plant pathogens may cause disease in plants?	(3)

3.3 What are toxins?(2)3.4 How do they function in the development of disease in a plant?(5)

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Question 4	

(6)

4.1 Various structural and biochemical defence mechanisms exist in plants to enable its survival against pathogenic invasion. State and explain any <u>three</u> pre-existing of these mechanisms in each case (12)

4.2 Tabulate the differences between <u>active</u> and <u>passive</u> invaders and give relevant examples of each.

4.3 Name **three** main groups of substances secreted by pathogens involved in pathogenicity (3)

END OF SECTION B

SECTION SUBTOTAL

[75]