

UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER: 2014/2015

TITLE OF PAPER: CRYPTOGAMIC BOTANY

COURSE CODE: B201

TIME ALLOWED: THREE HOURS

- INSTRUCTIONS:
1. THIS PAPER IS DIVIDED INTO FOUR SECTIONS
 2. ANSWER A TOTAL OF FOUR (4) QUESTIONS, CHOOSING ONE (1) QUESTION FROM EACH SECTION
 3. EACH QUESTION CARRIES TWENTY FIVE (25) MARKS
 4. ILLUSTRATE YOUR ANSWERS WITH LARGE AND CLEARLY LABELLED DIAGRAMS WHERE APPROPRIATE

SPECIAL REQUIREMENTS: NONE

THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATORS

SECTION A (BACTERIA)

Answer one question from this section

Question 1

- a) Compare Gram negative and Gram positive cell walls:
- i) Structurally (illustrate) (10 marks)
 - ii) Chemically (tabulate) (5 marks)
- b) What is bacterial transformation and how was it discovered? (10 marks)

[Total = 25 marks]

Question 2

- a) What is a plasmid and what does it code for? (5 marks)
- b) Explain and illustrate the sequence of events in an Hfr x F⁻ cross. (10 marks)
- c) Differentiate between an Hfr and a recombinant. (5 marks)
- d) Differentiate between prokaryotic and eukaryotic cells. (5 marks)

[Total = 25 marks]

SECTION B (FUNGI)Answer **one** question from this section**Question 3**

- a) Give at least five characteristics of fungi. (5 marks)
- b) Draw and fully label the life cycle of a named zygomycete of your choice. Indicate the diagnostic feature of the fungus you have chosen. (10 marks)
- c) Explain ascospore production using well labeled diagrams. (10 marks)

[Total = 25 marks]**Question 4**

- a) Draw and fully label the various stages in the life cycle of *Puccinia graminis* var. *tritici*.
N.B. i) Draw all the spore stages (15 marks)
ii) Indicate the nuclear condition of the fungus at each stage (3 marks)
iii) Name the host for each stage. (2 marks)
- b) What aspects of the biology of this fungus make it highly evolved and difficult to manage. (5 marks)

[Total = 25 marks]

SECTION C (ALGAE)

Answer **one** question from this section

Question 5

- a) List the general characteristics of the following algae divisions:
- i) Chlorophyta (5 marks)
 - ii) Phaeophyta (5 marks)
 - iii) Rhodophyta (5 marks)
- b) Draw and fully label the gametangia of *Chara* then explain its oogamous reproductive process. (10 marks)

[Total = 25 marks]

Question 6

- a) Prepare a possible evolutionary tree of the orders in Chlorophyta. (10 marks)
- b) Discuss the variety of vegetative forms observed in Chlorophyta. Cite named examples for each form. (15 marks)

[Total = 25 marks]

SECTION D (BRYOPHYTES)

Answer **one** question from this section

Question 7

- a) Draw and label the sporophytes of
- | | |
|-------------------|-----------|
| <i>Mnium</i> | (5 marks) |
| <i>Anthoceros</i> | (5 marks) |
| <i>Marchantia</i> | (5 marks) |
- b) What changes in the biology of bryophytes (from liverworts to mosses) have made them better adapted for terrestrial life.(10 marks)

[Total = 25 marks]

Question 8

- a) Discuss the life cycle of a named moss of your choice. Illustrate all stages. (15 marks)
- b) Compare thallophytes with bryophytes. Tabulate your answer. (10 marks)

[Total = 25 marks]