

UNIVERSITY OF SWAZILAND

MAIN EXAMINATION PAPER: DECEMBER 2016

TITLE OF PAPER: CRYPTOGAMIC BOTANY

COURSE CODE: BIO241/B201

- 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 ANSWER WITH LARGE AND CLEARLY LABELLED DIAGRAMS WHERE APPROPRIATE

SPECIAL REQUIREMENTS: NONE

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

SECTION A (BACTERIA)

Answer one question from this section.

Question 1

- (a) Draw and label the following:
- (i) an Hfr cell, (2½ marks)
 - (ii) a recombinant cell, (2½ marks)
- (b) (i) Illustrate an Hfr x F- mating and provide brief explanations next to each diagram. (10 marks)
- (ii) Explain clearly how the most common product of this mating is produced (5 marks)
- (c) What are the advantages of bacterial genetic recombination to bacteria? (5 marks)

[Total = 25 marks]**Question 2**

- a) Draw and fully label a Gram-negative bacterial cell wall. NB: State the dimensions of known components. (10 marks)
- b) Compare the chemical composition of a Gram-negative with wall a Gram-positive wall. Tabulate your answer. (10 marks)
- c) In what ways are bacteria of economic importance? (5 marks)

[Total = 25 marks]

SECTION B (FUNGI)

Answer one question from this section.

Question 3

- a) List at least five (5) characteristics of downy mildews. (5 marks)
- b) Draw and briefly explain how you would identify any two genera from the following: *Albugo*, *Phytophthora*, *Basidiophora*, *Pythium*. (5 marks)
- c) Draw and label the life cycle of a named downy mildew fungus. (15 marks)
- [Total = 25 marks]

Question 4

- a) Draw and label the life cycle of the rust *Puccinia graminis. tritici*.
NB: (i) state the nuclear condition of each spore (n, 2n, etc.)
(ii) indicate the hosts. (15 marks)
- b) Answer the following questions about the above rust fungi.
- (i) Is this rust autoecious or not? Why? (2 marks)
- (ii) What is the main function of the uredospore? (2 marks)
- (iii) Which is the sexual spore and why? (2 marks)
- (iv) Which spores bring about variability? (2 marks)
- (v) Why is this fungus a heterobasidiomycete? (2 marks)
- [Total = 25 marks]

SECTION C (ALGAE)

Answer one question from this section.

Question 5

- (a) Discuss and sketch the filamentous forms observed in algae. For each form, cite a known example from division Chlorophyta. (10 marks)
- (b) Draw sexual reproduction cycles observed in Phaeophyta. (15 marks)
- [Total = 25 marks]**

Question 6

- (a) Discuss the role of the following in the classification of algae:
- (i) photosynthetic pigments, (8 marks)
 - (ii) the nature of food reserves. (4 marks)
- (b) Draw the sexual reproductive cycles observed in the Florideophycidae. (13 marks)
- [Total = 25 marks]**

SECTION D (BRYOPHYTES)
Answer **one** question from this section.

Question 7

a) Prepare a table to compare thallophytes with bryophytes. (10 marks)

b) Draw the life cycle of a hornwort. (15 marks)

[TOTAL MARKS = 25]

Question 8

a) Prepare a table to compare the three subclasses of musci. (10 marks)

b) Draw and briefly explain the life cycle of a moss. (15 marks)

[TOTAL MARKS = 25]

END OF QUESTION PAPER