

UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION PAPER: JULY 2014

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 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

PTO

SECTION A (BACTERIA)

Answer **one** question from this section.

Question 1

- (a) What does a plasmid code for? (5 marks)
- (b) How is an Hfr bacterial cell similar to and different from an F^+ cell? Use annotated diagrams. (5 marks)
- (c) Explain the mating process of an Hfr with F^- . (10 marks)
- (d) Why are the products of the mating of an Hfr with F^+ different from those of an F^+ with F^- if the genetic material is the same? (5 marks)

[Total = 25 marks]

Question 2

- (a) Use annotated diagrams to explain specialized phage mediated genetic recombination in bacteria. (15 marks)
- (b) How and why does specialized phage mediated genetic recombination differ from the generalized one? (5 marks)
- (c) What are the advantages of genetic recombination in bacteria? (5 marks)

[Total = 25 marks]

PTO

SECTION B (FUNGI)

Answer **one** question from this section.

Question 3

- (a) Prepare a dichotomous key to help key out division Ascomycotina to its classes. (10 marks)
- (b) Further break down the powdery mildews to their respective genera using a dichotomous key or self-explanatory diagrams. (5 marks)
- (c) Define and illustrate the following structures:
- (i) basidia with basidiospores, (2 marks)
 - (ii) acervulus, (2 marks)
 - (iii) aethalium, (2 marks)
 - (iv) pycnidium, (2 marks)
 - (v) sporodochium. (2 marks)

[Total = 25 marks]

Question 4

- (a) Draw and briefly describe the life cycle of *Talaromyces/Penicillium*. Elaborate on stages in ascospore formation. (15 marks)
- (b) Discuss the plasmodium and its variations in fungi. (10 marks)

[Total = 25 marks]

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SECTION C (ALGAE)

Answer one question from this section.

Question 5

- (a) Briefly discuss criteria used in the classification of algae. (10 marks)
- (b) Discuss sexual reproduction in subclasses Florideophycidae of the Rhodophyta. (15 marks)
- [Total = 25 marks]**

Question 6

- (a) Using examples and sketches, briefly discuss the range of vegetative forms in the algae. (10 marks)
- (b) Gilbert Smith has a single division Chrysophyta which Ian Morris considers as three divisions. Prepare a table to compare features of Morris' groups, then argue for Smith's single group. (15 marks)
- [Total = 25 marks]**

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

Question 7

Discuss the life cycle of *Mnium* under the following headings:

- (a) Gametophyte (morphology and anatomy), (5 marks)
- (b) Gametangia (location and form), (4 marks)
- (c) Fertilization and the young sporophyte, (3 marks)
- (d) The mature sporophyte, (8 marks)
- (e) Spore release and spore germination. (5 marks)

[Total = 25 marks]

Question 8

- (a) Prepare a table to compare bryophytes with thallophytes. (10 marks)
- (b) Draw and fully label the sporophyte of *Anthoceros* on its gametophyte. (10 marks)
- (c) Explain why hornworts are better adapted for a terrestrial environment than liverworts. (5 marks)

[Total = 25 marks]

END OF EXAM PAPER