

**UNIVERSITY OF ESWATINI
RE-SIT EXAMINATION PAPER: 2018/2019**

TITLE OF PAPER: CRYPTOGAMIC BOTANY

COURSE CODE: B201/BIO241

TIME ALLOWED: THREE HOURS

- INSTRUCTIONS:**
- SECTIONS**
- 1. THIS PAPER IS DIVIDED INTO FOUR**
 - 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) Explain how bacterial transformation was first observed. For each different experiment used, provide an explanation for the results observed, and the post mortem result. (10 marks)
- b) Explain the mechanism of genetic transformation in bacteria. Illustrate your answer. (10 marks)
- c) How has the knowledge of bacterial genetic transformation been used to improve our lives? (5 marks)

[TOTAL MARKS = 25]

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. Illustrate your answer. (5 marks)
- d) Differentiate between a prophage and a transducing phage. Illustrate your answer. (5 marks)

[TOTAL MARKS = 25]

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SECTION B (FUNGI)

Answer **one** question from this section

QUESTION 3

- a) Draw a fully labelled diagram of the various stages in the life cycle of *Puccinia graminis* var *tritici*: NB:
- (i) Draw all the spores stages. (10 marks)
 - (ii) Indicate the nuclear condition of the fungus at each stage (3 marks)
 - (iii) Name the host at each stage (2 marks)
- b) Explain conjugative nuclear division and the formation of clamp connections. Illustrate your answer. (10 marks)

[TOTAL MARKS = 25]

QUESTION 4

- a) Give at least five characteristics of fungi. (5 marks)
- b) Draw and fully label the life cycle of *Rhizopus stolonifer* (10 marks)
- c) Explain how the morphology of the ascocarp is used in identifying genera of powdery mildews. Use diagram(s) to indicate the ornamentations. (10 marks)

[TOTAL MARKS = 25]

PTO

SECTION C (ALGAE)

Answer **one** question from this section.

QUESTION 5

- a) List the general characteristics of the division Phaeophyta. (4 marks)
- b) Draw a schematic of an evolutionary tree of the orders of the division Phaeophyta. (10 marks)
- c) Briefly describe what the evolutionary lines cyclosporaes, heterogeneratae and isogeneratae imply. (6 marks)
- d) Differentiate between haplostichous and polystichous forms. (5 marks)

[TOTAL MARKS = 25]

QUESTION 6

- a) Draw a typical life cycle that is described as heterogeneratae life cycle. (10 marks)
- b) Describe the various ways of oogonia development in the cyclosporaes. (10 marks)
- c) Use a fully labelled diagram to illustrate a Fucus oogonium in an oogonial conceptacle. (5 marks)

[TOTAL MARKS = 25]

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, (3 marks)
- e) Spore release and spore germination. (5 marks)

[TOTAL MARKS = 25]**QUESTION 8**

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

[TOTAL MARKS = 25]**END OF EXAMINATION PAPER**