

COURSE CODE: B201/BIO241 (RE-SIT) 2019/2020

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**UNIVERSITY OF ESWATINI
RE-SIT EXAMINATION PAPER: 2019/2020**

TITLE OF PAPER: CRYPTOGAMIC BOTANY

COURSE CODE: B201/BIO241

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

SECTION A (BACTERIA)

Answer **one** question from this section.

Question 1

- a) Explain phage mediated genetic recombination in bacteria using annotated diagrams. (15 marks)
- b) How is an endospore formed? Illustrate the steps. (5 marks)
- c) What are the advantages of genetic recombination and endospore formation in bacteria? (5 marks)

(Total Marks=25)

Question 2

- a) Discuss the discovery of transformation and the explanations scientists of the time presented for the experimental outcomes. (10 marks)
- b) Explain our understanding of transformation and the reason why its discoverer could not explain it. (10 marks)
- c) Give at least five points of the positive contributions of bacteria to society. (5 marks)

(Total Marks=25)

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) What are the advantages of the following conditions in the life of *Puccinia graminis* var *tritici*
- i. Heteroecism (2 marks)
 - ii. Karyogamy and meiosis (2 marks)
 - iii. Spermatization (2 marks)
 - iv. Uredospore (2 marks)
 - v. Basidiospores and aeciospores (2 marks)

(Total Marks=25)

Question 4

- a) Explain the possible evolution of the peronosporales (downy mildews) using an annotated evolutionary tree. (10 marks)
- b) Draw and mention the identifying features of any five of the following fungi:
- i. *Rhizopus stolonifera*
 - ii. *Pilobolus*
 - iii. *Phycomyces*
 - iv. *Pythium*
 - v. *Basidiophora*
 - vi. *Albugo*
 - vii. *Penicillium*
 - viii. *Aspergillus*
- (5×2 marks)
- c) Discuss the different kinds of plasmodia found in fungi. (5marks)

(Total Marks=25)

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SECTION C (ALGAE)

Answer **one** question from this section

Question 5

- a) Discuss the criteria used to classify algae. (10 marks)
- b) Tabulate to compare Morris' Xanthophyta Chrysophyta and Bacillariophyta. (15 marks)

(Total Marks=25)

Question 6

- a) Discuss sexual reproduction in
- i. Unicellular Zygnematales, (2 marks)
 - ii. Filamentous Zygnematales, (3 marks)
 - iii. Chara (illustrate the gametangia). (10 marks)
- b) Discuss the range of form or somatic structures in algae. Cite examples. (10 marks)

(Total Marks=25)

SECTION D (BRYOPHYTES)

Answer **one** question from this section

Question 7

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

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

(Total Marks=25)

Question 8

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

(Total Marks=25)