

UNIVERSITY OF SWAZILAND
FACULTY OF SCIENCE AND ENGINEERING
DEPARTMENT OF BIOLOGICAL SCIENCES

RE-SIT EXAMINATION PAPER 2017/2018

- PROGRAMMES:** B.Sc. III
B. Ed Secondary III
- COURSE CODE:** BIO341
- TITLE OF PAPER:** ADVANCED MOLECULAR BIOLOGY
- TIME ALLOWED:** THREE (3) HOURS
- INSTRUCTIONS:**
1. ANSWER QUESTION ONE (COMPULSORY) IN SECTION A AND ANY OTHER TWO QUESTIONS IN SECTION B.
 2. QUESTION 1 CARRIES 50 MARKS AND EACH QUESTION IN SECTION B CARRIES 25 MARKS.
 3. ILLUSTRATE YOUR ANSWERS WITH LARGE CLEARLY LABELLED DIAGRAMS WHERE APPROPRIATE

DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY THE CHIEF INVIGILATOR

SECTION A [Compulsory]**Question 1**

- (a) Describe the lysogenic and lytic life cycles of bacteriophages. (20 marks)
- (b) Discuss the importance of bacteriophages in molecular biology research. (15 marks)
- (c) Briefly explain the different forms of gene mutations. Further discuss how the Ames Mutagenicity Test can be used to check the carcinogenic potential of chemical substances. (15 marks)

[Total = 50 marks]

SECTION B (Answer any two questions in this section)**Question 2**

Discuss the application of molecular markers in human forensics. (25 marks)

Question 3

- (a) Explain the ideal characteristics of a suitable cloning vector and expression vector. (10 marks)
- (b) Describe the intrinsic characteristics of any three cloning vectors and any two expression vectors. (15 marks)

[Total = 25 marks]

Question 4

- (a) Explain how the following can be achieved:
- (i) site-directed mutagenesis, (5 marks)
- (ii) gene knock-outs. (10 marks)

- (b) Discuss the molecular biology of transposable elements. (10 marks)

[Total = 25 marks]