

BOWEN UNIVERSITY, IWO
COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE
MICROBIOLOGY PROGRAMME
2022/2023 FIRST SEMESTER EXAMINATION
MCB 405: MICROBIAL GENETICS (THEORY)

Answer **three** questions.

Time allowed: 2h 15 min

1. (a) Why is *Neurospora* still a preferred model organism in genetics? (10 marks)
(b) Define the following terms:
 - (i) Principle of segregation (2 marks)
 - (ii) Principle of Independent Assortment (2 marks)
 - (iii) Purebred (2 marks)
 - (iv) Gene flow (2 marks)
 - (v) Mutagenesis (2 marks)(c) Highlight 5 molecular technologies used in genetic analyses (5 marks)

2. (a) Fully discuss substitution as a type of DNA mutation (15 marks)
(b) The fields of molecular biology and genetics depend largely on plasmids, discuss the following types of specific plasmids
 - (i) R plasmids (5 marks)
 - (ii) F-plasmids (5 marks)

3. Discuss in detail the merits and demerits of using microorganisms for biotechnological research (25 marks)

4. (a) Define 'conjugation' as it relates to bacteria (5 marks)
(b) Discuss the major processes in bacterial conjugation (10 marks)
(c) Comment on any **four** unique characteristics of transduction (10 marks)

5. (a) Explain how physical mutagens cause mutations in living organisms (5 marks)
(b) Succinctly discuss **five** applications of Genetic engineering (5 marks)
(c) Differentiate between the following:
 - (i) Resistant mutants and Auxotrophic mutants (5 marks)
 - (ii) Restriction endonuclease and DNA ligase (5 marks)
 - (iii) DNA Modifying agents and Base analogs (5 marks)