BOWEN UNIVERSITY, IWO
COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE

MICROBIOLOGY PROGRAMME
2021/2022 FIRST SEMESTER EXAMINATION

MCB 405: MICROBIAL GENETICS (THEORY)

Answer any **three** questions. **Time allowed:** 2h 15min

1. (a) Define the following terms:
   (i) Plasmid **(2 marks)**
   (ii) Mutagenesis **(2 marks)**
   (iii) Transcription **(2 marks)**
   (iv) Translation **(2 marks)**
   (v) Mutagens **(2 marks)**
   (b) Briefly discuss three types of mutations **(10 marks)**
   (c) Highlight 5 mechanisms of DNA repair **(5 marks)**

2. (a) Why is *Neurospora* still a favoured model organism in genetics? **(10 marks)**
   (b) Briefly discuss the role of *nif* gene in the fixation of atmospheric nitrogen **(10 marks)**
   (c) Highligh 4 major causes of mutation **(5 marks)**

3. Briefly comment on the following:
   (a) Recombination **(5 marks)**
   (b) Merozygote **(4 marks)**
   (c) Lysogeny **(5 marks)**
   (d) Competent cell **(6 marks)**
   (e) Hfr cell **(5 marks)**

4. (a) Discuss the advantages of using microorganisms for biotechnological research **(15 marks)**
   (b) Comment on the unique characteristics of transduction **(10 marks)**

5. (a) Describe the concept and three main goals of genetic engineering **(5 marks)**
   (b) Briefly discuss five advantages of Genetic engineering **(5 marks)**
   (c) Differentiate between the following:
   (i) Base analogs and Intercalating agents **(5 marks)**
   (ii) Spontaneous and Induced mutations **(5 marks)**
   (iii) Auxotrophic mutants and Conditional-Lethal mutants **(5 marks)**