National Open University of Nigeria
Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja
Faculty of Science
Department of Biological Sciences
2022_2 EXAMINATION

Course code: BIO 301. **Course title: Genetics II**
Units: 2 **Time allowed: 2 Hours**

INSTRUCTION: Answer question ONE (1) and any other TWO (2) questions

1. a. State the goals of population genetics **3 Marks**
   b. State Hardy-Weinberg Principle **2 Marks**
   c. List five (5) evolutionary influences that could alter the Hardy-Weinberg equilibrium **5 Marks**
   d. Mention the five (5) assumptions underlying Hardy-Weinberg equilibrium **5 Marks**
   e. Write the binomial expression for Hardy-Weinberg expression **2Marks**
   f. Enumerate the role of structural chromosomal aberrations in plant breeding. (5 marks)
   g. The sample of 6,129 Caucasian people includes the following three groups according to phenotypes and genotypes on M-N system

S/No.	Phenotype	Genotype	Number
1	M	L^ML^M	1,787
2	MN	L^ML^N	3,039
3	N	L^NL^N	1,303
TOTAL			**6,129**

Assuming the population is at equilibrium, calculate the frequencies of the population. **8 Marks**

2a. State the meaning of paralogous DNA **2 Marks**
b. Define the term plasmids and list the types of genes that are present in R plasmids **3 Marks**
c. What did you understand by Paleopolyploidy **5 Marks**
d. Write a comprehensive note on nucleic acids **10 Marks**

3a. List six (6) examples of polyploidy crops. **3 Marks**
b. Succinctly, describe each of the following concepts:
   i. Horizontal gene transfer **7Marks**
   ii. Autotriploid **10 Marks**

4 a. Outline the genetic consequences of inversions in living organisms **4 Marks**

b. Highlight the features of protein structure **8 Marks**

c. Explain the genetics of Sickle-cell anaemia as a form of human polymorphism **8 Marks**

5a. Mention the exceptions to Mendel's Laws **5 Marks**
b. Write concisely on messenger RNA **6 Marks**
c. List the stop codons **1½ Marks**
d. List five examples of physical mutagens **2½ Marks**
e. Describe the structure of a virus **5 Marks**