



**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	$L^M L^M$	1,787
2	MN	$L^M L^N$	3,039
3	N	$L^N L^N$	1,303
<b>TOTAL</b>			<b>6,129</b>

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**