NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCE
Department of Biological Sciences
2023_1 POP EXAMINATION

COURSE CODE: BIO301
COURSE TITLE: GENETICS II
CREDIT: 2 UNITS
TIME ALLOWED: 2 HOURS
INSTRUCTION: ANSWER NUMBER ONE (1) AND ANY OTHER TWO (2) QUESTIONS

1a. What do you understand by microbial genetics? **(2 mark)**
b. Mention two ways that genetic information flows in bacteria. **(2 marks)**
c. Describe the antibodies and blood antigens relationships in ABO blood group. **(5 marks)**
d. Define polygenic inheritance. **(2 mark)**
e. Outline three ways by which polygenic traits are distinguished. **(2 marks)**
f. Define the following terms: **(6 marks)**
i. Euploidy.
ii. Isochromosome.
iii. Shifts.
iv. Translocation.
g. As a human geneticist, how will you apply aneuploidy in crop improvement? **(11 marks)**

2a. Explain what is meant by structural chromosomal aberration. **(4 mks)**
b. List the two types of structural chromosomal aberrations. **(2mks)**
c. Enumerate the four genetic significance of duplication you know. **(4mks)**
d. In a tabular form, differentiate between monoploids and haploids. **(4 marks)**
e. Describe how you can determine if there is any mutant colony in a culture. **(6 marks)**

3a. Define genetic transfer. **(2 marks)**
b. Describe the mechanisms of balancing selection. **(4 marks)**
c. Outline the steps in specialized translocation. **(5 marks)**
d. Polyploids are of significant effects. Discuss. **(9 marks)**

4a. Mention any two goals of population genetics you know. **(2 marks)**
b. Why do we study populations and gene frequencies. **(3 marks)**

c. The table below provides the genotype of 3800 people in Abuja metropolis.

Genotype	No of Individuals
AA	1000
Aa	2000
Aa	800

Using the table above, calculate the:

i. Genotype frequencies **(3 marks)**

ii. Allelic frequencies **(2 marks)**

d. Write short notes on the following:

(i) Co-dominance. **(5 marks)**

(ii) Dosage compensation. **(5 marks)**

5a. List the two important features in the structure of DNA. **(2 marks)**

b. A homozygous red snapdragon flower was crossed with a homozygous white snapdragon flower; **(3 marks)**

i. What is the colour of the first progeny?

ii. What type of non - Mendelian inheritance was displayed in the cross/progeny?

iii. When the F1 are self fertilized, what will be the outcome of the second progeny?

c. Enumerate the importance of structural chromosomal aberrations in plant breeding. **(5 marks)**

d. Account for the defects of abundant and structural proteins. **(10 marks)**