



NATIONAL OPEN UNIVERSITY OF NIGERIA
Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja
Faculty of Science

DEPARTMENT OF BIOLOGICAL SCIENCES

2024_2 EXAMINATION

COURSE CODE: BIO 403
COURSE TITLE: POPULATION GENETICS
CREDIT: 2 Units
TIME ALLOWED: 2 Hours

Instructions: Attempt question number One (1) and any other TWO (2) questions. Question number one (1) carries (30) marks, while the other questions carry (20) marks each.

1. A population is in Hardy-Weinberg equilibrium. The gene of interest has two alleles, with 16% of the population portraying the features of the recessive phenotype. (a) What percentage of the population is heterozygous? (10 marks)
 - (b) Describe codominance as it relates to population genetics (10 marks)
 - (c) Explain the term allele (10 marks)
- 2 (a) Distinguish between genotypic and allelic frequencies (10 marks)
 - (b) A study revealed the numbers of individuals in the village with different A-B blood group phenotypes as shown in the table. Compute the genotypic frequencies of each phenotype. (10 marks)
- 3 (a) Discuss mutation as it affects evolution and genetic structure in a population (14marks)
 - (b) Explain bottleneck effect (6marks)
- 4 (a) Highlight the effects of natural selection on evolutionary changes (10 marks)
 - (b) State the effects of gene flow on a population (6 marks)
 - (c) Establish the difference between inbreeding and outbreeding (4 marks)
5. Write short notes on the followings:
 - (a) X linked traits (12 marks)
 - (b) Gene pool (3 marks)
 - (c) Genetic drift (5 marks)