



National Open University of Nigeria
Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi – Abuja
Faculty of Science
Department of Pure and Applied Sciences

JANUARY, 2021 EXAMINATION...

COURSE CODE: BIO307
COURSE TITLE: EVOLUTION
CREDIT UNIT: 2
TIME ALLOWED: 2 HOURS

INSTRUCTION: ANSWER QUESTION 1 AND ANY OTHER THREE QUESTIONS

1. a. What are deleterious alleles? **5 Marks**
b. Copy and complete the table below:

Plant	Probable ancestral haploid number	Chromosome number	Ploidy level
Domestic Oat	7	42	
Peanut		40	4n
Sugarcane	10		8n
Banana	11	33	
Cotton	13	52	

5 Marks

- c. The sample of 18,387 Caucasian people comprises of 5,361 $L^M L^M$, 9,117 $L^M L^N$, and 3,909 $L^N L^N$ according to phenotypes and genotypes on M-N system. Assuming the population is at equilibrium; calculate the frequencies of the population. **8 Marks**
d. Briefly enumerate the concept of fossil evidence **5 Marks**
e. List two detritivores **2 Marks**

2. a. Differentiate between parapatric and peripatric speciations **6 Marks**
b. The population of organisms in a grassland ecosystem comprise of 5,842,000 primary producers, 708,000 primary consumers, 354,000 secondary consumers and 3 tertiary consumers. Use the information to draw a pyramid of number. **5 Marks**
c. Differentiate between sympatric and allopatric speciation **4 Marks**
3. a. What is the fate of neutral alleles in a population? **6 Marks**

b. A biotic community is made up of the following members: Cougar, Deer, Grass, Insects, Mouse, Rabbit, Shrew and snake. Use these organism to construct a food web for the community

5 Marks

c. What will be the population of Teaks in a Teak plantation after 10 years given that $N_0 = 4000$, per capita growth rate = 0.5, Euler's Constant = 2.71828.

4 Marks

4 a. Write the binomial expression for Hardy-Weinberg expression

2 Marks

b. Write a note on sexuality in bryophytes

6 Marks

c. Explain the implication of migration on evolution of new genotype

7 Marks

5 a. Enumerate the concept of homology

4 Marks

b. Draw an annotated logistic growth curve

3 Marks

c. What do you understand by Biological species concept?

5 Marks

d. Mention the name of the Island visited; the location and the number of Finches species identified by Charles Darwin during his Voyage on HMS Beagle in 1831.

3 Marks