



**ELIZADE UNIVERSITY,
ILARA-MOKIN, NIGERIA**

FACULTY: BASIC & APPLIED SCIENCES

DEPARTMENT: BIOLOGICAL SCIENCES

FIRST SEMESTER EXAMINATION

2017/2018 ACADEMIC SESSION

COURSE CODE: BIO 201

COURSE TITLE: INTRODUCTORY GENETICS

DURATION: 2 HOURS

HOD's SIGNATURE

NAME:.....

MAT. No:.....

INSTRUCTIONS

Answer any FOUR questions.

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- (a)(i) What is test cross? (ii) Why is it not possible to use a homozygote dominant organism (such as TT) in a test cross experiment to determine the genotype of an organism showing the dominant phenotype? Discuss your answers with appropriate genetic symbols.
 - (b) A pure strain of mice with brown-coloured fur (BB: dominant) was bred with a pure strain of mice with grey-coloured fur (bb: recessive). If the F₁ mice are allowed to interbreed they produce an F₂ mice generation with both fur colours, explain the result of both F₁ and F₂ generations in terms of (i). Genotype ratio and (ii) Phenotype ratio.
 - (c) What will be the outcome of mating a brown-coloured heterozygote from the F₂ generation with the original grey-coloured parent in (b) above?
 - (a) Give an account of the chemical components of nucleic acid, and mention the two (2) types of bonds that link its components together.
 - (b) DNA replication is semi-conservative, explain.
 - (c) Highlight three (3) differences between DNA and RNA molecules.
 - (a) What are the functions of centromere and telomere in a chromosome?
 - (b) Is there a correlation between the number of chromosomes and the complexity of an organism? Explain.
 - (c) Differentiate between:
 - Homologous chromosomes and Sister chromatids
 - Autosomal chromosomes and Sex-linked chromosome
 - Partial dominances and Codominance
 - Pleiotropy and Epistasis
 - Penetrance and Expressivity
 - (a) Transcription of DNA occurs in three (3) steps;
 - List the steps involved in (a) above
 - Explain any two (2) of the steps listed in (i) above
 - (b) Differentiate between transfer RNA (tRNA) and messenger RNA (mRNA).
 - (c) Describe the roles of the following enzymes as regards DNA replication:
 - DNA Polymerase,
 - Helicase,
 - Topoisomerase, and
 - Ligase
 - (a) What is a cell cycle? List and explain three checkpoints regulating cell division in eukaryotes.
 - (b) Enumerate four significance of mitosis.
 - (c) What would be the consequence for future generations of cells if sperm and egg cells were normally diploid?
 - (a) i. Explain mutation and state its major causes.
 - ii. State the difference between nucleotide and nucleoside.
 - (b) i. Draw a schematic representation of a nucleoside.
 - ii. What is the complementary base pair to DNA sequence that has the following order?
ATACCTGAAT
 - (c) Briefly describe:
 - DNA Replication, and
 - Translation