



ALUPE UNIVERSITY
COLLEGE

... Passion of Knowledge...

P. O.Box 845-50400 Busia(K)
principal@auc.ac.ke
Tel: +254 741 217 185
+254 736 044 469
off Busia-Malaba road

OFFICE OF THE DEPUTY PRINCIPAL
ACADEMICS, STUDENT AFFAIRS AND RESEARCH

UNIVERSITY EXAMINATIONS

2021 /2022 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER REGULAR EXAMINATION

FOR THE DEGREE OF BACHELOR OF EDUCATION SCIENCE

COURSE CODE: BOT 203E
COURSE TITLE: GENERAL GENETICS AND
 EVOLUTION

DATE: 2ND JUNE 2022 TIME: 9.00 A.M – 12.00 P.M

INSTRUCTIONS TO CANDIDATES

- SEE INSIDE

THIS PAPER CONSISTS OF 3 PRINTED PAGES

PLEASE TURN OVER

BOT 203 E

REGULAR – MAIN EXAM

BOT 203 E: GENERAL GENETICS AND EVOLUTION

STREAM: BED (SCIENCE)

DURATION: 3 Hours

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INSTRUCTIONS TO CANDIDATES

- i. Answer ALL questions from section A and any **FOUR** from section B.*
 - ii. Diagrams should be used whenever they serve to illustrate the answer.*
 - iii. Do not write on the question paper.*
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SECTION A (30 MARKS)

Question One

- a) Distinguish between spontaneous and induced mutations (2 Marks)
- b) What is the interphase stage of a cell cycle? (2 Marks)
- c) State two advantages of an organism possessing two sets of chromosomes. (4 Marks)
- d) Explain four types of chromosomal mutations. (4 Marks)
- e) Explain three causes of polyploidy (3 Marks)

Question Two

- a) Name three enzymes and state their functions during DNA replication process. (3 Marks)
- b) Give three reasons why Gregory Mendel used the garden pea plant in his experiments. (3 Marks)
- c) Outline three criticisms of using fossil records as evidence in support of an evolutionary theory. (3 Marks)
- d) Differentiate between
 - i. Homogametic sex and heterogametic sex (2 Marks)
 - ii. Heterochromatin and Euchromatin (2 Marks)
 - iii. Homozygous alleles and heterozygous alleles. (2 Marks)

SECTION B (40 MARKS)

Question Three

- a) Describe four stages of mitosis (4 Marks)
- b) Outline three significance of mitosis to living organisms (3 Marks)
- c) Explain three differences between mitosis and meiosis. (3 Marks)

Question Four

- a) What is post-zygotic isolation mechanism (1 Mark)
- b) Distinguish between allopatric and sympatric speciation (1 Mark)
- c) Explain four pre-zygotic isolating mechanisms that lead to speciation. (8 Marks)

Question Five

- a) State the Hardy Weinberg Law (2 Marks)
- b) Explain three factors that can disturb genetic equilibrium (6 Marks)
- c) Explain what is meant by the term species (2 Marks)

Question Six

- a) Describe the composition of Deoxyribose Nucleic Acid. (2 Marks)
- b) State four requirements of the genetic material (2 Marks)
- c) Describe the main steps of DNA replication (6 Marks)

Question Seven

- a) Explain the following evidences of evolution
 - i. Comparative anatomy (2 Marks)
 - ii. Comparative embryology (3 Marks)
 - iii. Comparative biochemistry (2 Marks)
- b) Explain Lamarckism's theory of evolution (3 Marks)
