

BOT 400E



ALUPE UNIVERSITY
COLLEGE

... Bastion of Knowledge ...

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OFFICE OF THE DEPUTY PRINCIPAL
ACADEMICS, STUDENT AFFAIRS AND RESEARCH

UNIVERSITY EXAMINATIONS

2021 /2022 ACADEMIC YEAR

FOURTH YEAR FIRST SEMESTER REGULAR EXAMINATION

FOR THE DEGREE OF BACHELOR OF EDUCATION SCIENCE

COURSE CODE: BOT 400E

COURSE TITLE: ADVANCED GENETICS

DATE: 27TH JANUARY 2022

TIME: 12.00PM – 05.00PM

INSTRUCTIONS TO CANDIDATES

- SEE INSIDE

THIS PAPER CONSISTS OF 3 PRINTED PAGES

PLEASE TURN OVER

REGULAR –MAIN EXAM
BOT 400E: ADVANCED GENETICS

STREAM: BED (SCIENCE)

DURATION: 3 Hours

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) Highlight four advantages of *Pisum sativum* over other experimental organisms in genetics. (4 Marks)
- b) Describe the segments of a transcribed DNA strand.
 - i. Exons (2.5 Marks)
 - ii. Introns (2.5 Marks)
- c) Classify chromosomes based on their morphology. (4 Marks)
- b) State the principle of independent assortment. (2 Marks)

Question Two

- a) Distinguish between a constitutive and inducible enzymes. (2 Marks)
- b) Differentiate between:-
 - i. Homogametic sex and Heterogametic sex (4 Marks)
 - ii. Dominant allele and Recessive allele (3 Marks)
- c) Highlight three applications of genetics in plant and animal breeding. (6 Marks)

SECTION B (40 MARKS)

Question Three

A homozygous purple-flowered short-stemmed plant was crossed with a homozygous red-flowered long-stemmed plant and the F_1 generation was test crossed with a double homozygous recessive plant, the following progeny were produced.

52 purple flower, short stem

47 purple flower, long stem

49 red flower, short stem

45 red flower, long stem

Explain these results.

(10 Marks)

Question Four

Write notes on:-

- a) Incomplete dominance (3 Marks)
- b) Codominance (2 Marks)
- c) Test cross (2 Marks)
- d) Aneuploidy (3 Marks)

Question Five

Discuss two forms of artificial selection in a population.

(10 Marks)

Question Six

Explain mechanisms by which genes are regulated within the cell.

(10 Marks)

Question Seven

a). Describe a gene as:-

- i. A unit of recombination (1 Mark)
- ii. A unit of function (1 Mark)

b) Explain four main features of a genetic code. (8 Marks)
