



MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF PURE, APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PHYSICAL AND BIOLOGICAL SCIENCES

UNIVERSITY ORDINARY EXAMINATION

2019/2020 ACADEMIC YEAR

THIRDYEAR SECOND SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE IN EDUCATION

ABT 300– GENERAL GENETICS

DURATION:2 HOURS

Instructions to candidates:

1. Answer question One and Any Other Two questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

- a) If you have two hypothetical recessive mutant strains “O” and “P” females, what are the genotypes and phenotypes of progeny? (Illustrate with punnet square or otherwise). (5 marks)
- b) If the phenotype of mutant “O” from Q(a) is dark bodies and the phenotype of mutant “P” is Sepia, what would be the phenotype of the F1 progeny given the cross of “O” mates × “P” females? (Illustrate with punnet square or otherwise). (5 marks)
- c) If the phenotype of both mutant “O” and mutant “P” strains was orange eyes, what would be both genotypes and phenotypes of F1? (Illustrate with punnet square or otherwise). (5 marks)
- d) Using a well-labelled diagram, illustrate the anatomical structure of any eukaryotic cell. (5 marks)
- e) Outline the Lac Operon model of prokaryotic cell metabolism. (5 marks)
- f) Describe any three chromosomal aberrations in eukaryotic cells. (5 marks)

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION(40marks)

QUESTION TWO (20 MARKS)

Discuss gene regulation mechanisms occur in eukaryotic cells. (20 marks)

QUESTION THREE (20 MARKS)

Discuss the key phases of Binary Fission of prokaryotic cell division process. (20 marks)

QUESTION FOUR (20 MARKS)

With well-labelled diagrams, discuss the process that allows gamete cell generation such as oogenesis or spermatogenesis processes. (20 marks)