



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND
TECHNOLOGY**

SCHOOL OF AGRICULTURAL AND FOOD SCIENCES

**SECOND YEAR FIRST SEMESTER UNIVERSITY EXAMINATION FOR
THE DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURAL
EXTENSION EDUCATION**

2016/2017 ACADEMIC YEAR

REGULAR

COURSE CODE: AAB 3217

COURSE TITLE: Molecular Cell Biology

EXAM VENUE: **STREAMS:** Bsc. Agricultural Education and Extension

DATE: **EXAM SESSION:**

TIME: 2 HOURS

Instructions:

- 1. Answer ALL questions in section A and ANY other 2 Questions in section B.**
- 2. Candidates are advised not to write on question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

SECTION A [30 MARKS]

Answer ALL questions from this Section.

1. With an appropriate illustrations, explain a gene locus (3 marks)
2. Describe the fate of pyruvate in anaerobic respiration in plants (4 marks)
3. Describe the functions of the following in plants
 - (i) Chloroplasts (2 marks)
 - (ii) Mitochondria (2 marks)
4. Using illustrations, explain Recombinant DNA Technology as used in plant biotechnology (4 marks)
5. (i) Describe the mechanism of DNA amplification in a PCR thermocycler (5 marks)
(ii) State and explain the use of various cloning vectors used in genetic engineering (4 marks)
(iii) Describe the basic steps in cloning an amplified fragment of DNA into a cloning vector (6 marks)

SECTION B [40 MARKS]

Answer ANY TWO questions from this Section.

6. (i) Describe cell cycle (5 marks)
(ii) Explain the process of mitosis and outline the differences in mitotic division in plants and animals (15 marks)
7. (i) Describe the major properties of DNA that distinguish it from RNA (10 marks)
(iii) Describe the three main methods used in Next Generation Sequencing of DNA (10 marks)
8. State and explain the techniques used in isolation and characterization of proteins (20 marks)