



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

**SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES**

**DEPARTMENT OF BIOLOGICAL SCIENCES**

**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF EDUCATION  
SCIENCE WITH IT**

**3<sup>RD</sup> YEAR 2<sup>ND</sup> SEMESTER 2016/2017 ACADEMIC YEAR**

**MAIN CAMPUS - REGULAR**

---

**COURSE CODE: SZL 303**

**COURSE TITLE: GENERAL GENETICS**

**EXAM VENUE:LR 1**

**STREAM: (BED)**

**DATE: 21/04/17**

**EXAM SESSION: 9.00 – 11.00 AM**

**TIME: 2 HOURS**

---

**Instructions:**

- 1. Answer ALL questions in Section A and Any two 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: SHORT ANSWER QUESTIONS (30 MARKS)**

1. Explain the effect of the lethal allele on the phenotypes of yellow mice. (3 marks)
2. Using an example, explain phenotypic differences that can be observed in a sex-influenced character. (3 marks)
3. Explain the effect of genomic imprinting on heredity. (3 marks)
4. Illustrate a submetacentric chromosome. (3 marks)
5. Distinguish between autopolyploidy and allopolyploidy explaining the origin of each. (3 marks)
6. Explain the effect of temperature on the expression of the Himalayan allele in rabbits. (3 marks)
7. Outline three differences between prokaryotic gene & eukaryotic gene regulation. (3 marks)
8. Explain how alternative messenger RNA processing can be used to achieve gene regulation in eukaryotes. (3 marks)
9. Describe the effects of transposable elements on genomes. (3 marks)
10. State and describe the functions of the enzymes involved in the genetic control of lactose metabolism. (3 marks)

## **SECTION B: ESSAY QUESTIONS (40 MARKS)**

11. Explain the concept of gene interaction using dominant and recessive epistasis as examples. (20 marks)
12. Discuss how prokaryotic gene regulation is achieved through negative inducible and negative repressible operons. (20 marks)
13. Discuss the phenotypic effect of chromosomal rearrangements. (20 marks)
14. Discuss polygenic inheritance of kernel colour in wheat. (20 marks)