JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF AGRICULTURAL AND FOOD SCIENCES

FOURTH YEAR SECOND SEMESTER UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN HORTICULTURE

2018/2019 ACADEMIC YEAR

REGULAR

COURSE CODE: AAS 3326

COURSE TITLE: PRINCIPLES OF MOLECULAR GENETICS

EXAM VENUE: **STREAM: BSc. Horticulture**

DATE: 24/4/19 **EXAM SESSION: 12.00 – 2.00pm**

TIME: 2 HOURS

Instructions:

1. **Answer ALL the questions in section A and any TWO 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 a. Define molecular marker (1 mark)

b By 1966 the search for the genetic code was over. State three principles of the genetic code (3 marks)

c. Briefly illustrate and discuss the shapes of the chromosome as a result of varying position of the centromere (3 marks)

d. Using a diagram explain how genes are structured to ensure their expression. (3 marks)

2. a. Explain forward and reverse genetics (4 marks)

b. Define chromosomal mutations and discuss with illustrations the various forms of chromosomal mutations (3 marks)

c. State the process of maturation of pre MRNA (2 marks)

3. a. Using a diagram explain DNA replication (4 marks)

b. When does markers assisted selection really help? (3marks)

c. State types of RNAs and their function (3 marks)

SECTION B [40 MARKS]

Answer any TWO QUESTIONS from this Section.

Q3. Discuss molecular techniques applicable to plant and animal sciences towards sustainable food security (20 marks).

Q4. Discuss different types of molecular markers including their applications, merits and demerits (20 marks)

Q5. Transcription and translation are two main processes in gene expression. Discuss in details these two processes. (20 marks)