JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE & TECHNOLOGY

SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR SCIENCE IN BIOLOGICAL SCIENCES

3RD YEAR 2ND SEMESTER 2018/2019 ACADEMIC YEAR

MAIN CAMPUS - REGULAR

COURSE CODE: **SBI 3321**

COURSE TITLE: **EVOLUTIONARY BIOLOGY**

EXAM VENUE: **BIO LAB** **STREAM (BIO)**

DATE: **23/04/2019** **EXAM SESSION: 3.00-5.00PM**

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 (40 MARKS)

1.Briefly describe chemical evolution. (3 Marks)

2. Define:

a) Epistasis (1 Mark)

b) Mendel's Law of Segregation (1 Mark)

c) Pleiotropy (1 Mark)

2. Outline any three mechanisms of microevolution (3 Marks)

3. With examples, distinguish between:

a) Peripatric and sympatric speciation. (2 Marks)

b) Gradualism and punctuated equilibrium (2 Marks)

c) Deme and gene pool (2 Marks)

4. Describe any three prezygotic barriers that isolate population gene pools lead to the emergence of new species. (3 Marks)

5. Distinguish between microevolution and macroevolution (2 marks)

6. Describe the differences between anagenesis and cladogenesis. (3 Marks)

7. Describe any three macroevolutionary processes. (3 Marks)

8. Describe the differences between sympatric and vicariant speciation. (2 marks)

9. With referees to a specific example, describe character displacement. (2 Marks)

SECTION B: ESSAY QUESTIONS (40 MARKS)

10. Discuss the agents of evolutionary change (20 Marks)

11. Describe how reproductive isolation mechanisms lead to the emergence of a new species (20 Marks)

12. (a) Using a Test Cross and Punnet square, illustrate the behaviour of alleles in a cross between an individual with SySy genotype and another with a similar genotype. (15 Marks)

(b) Describe the type of cross performed. (1 Mark)

(c) Determine the genetic ratios of the phenotypes. (4 Marks)

13. Discuss the different modes of action of natural selection. Give examples of each. (20 Marks)