



SOUTH EASTERN KENYA UNIVERSITY
UNIVERSITY EXAMINATIONS 2016/2017

**SECOND SEMESTER EXAMINATION FOR THE DEGREES OF BACHELOR
OF SCIENCE IN BIOLOGY & BACHELOR OF SCIENCE IN EDUCATION
(SCIENCE)**

SBL 305: PRINCIPLES OF GENETICS

DATE: 10TH APRIL, 2017 TIME:10.30-12.30 P.M

INSTRUCTIONS TO CANDIDATES

- (a) Answer ALL the Questions in Section A**
(b) Answer ANY TWO Questions in Section B
(c) Illustrate your answers with well labeled diagrams where appropriate
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SECTION A (30 Marks)

1. State the general features of model organisms rendering them ideal for genetics studies.
(4 Marks)
2. The central dogma describes how genes are expressed.
(a) Is this statement True or False. **(1 Mark)**
(b) Support your answer in 2a above. **(1 Mark)**
3. How does the genetic material of prokaryotes and eukaryotes differ? **(3 Marks)**
4. Organisms differ in their complexity in terms of chromosomes and genes. Briefly explain. **(4 Marks)**
5. State why plasmids are essential in bacteria. **(4 Marks)**
6. Briefly explain how multiple drug resistance can be transferred between bacterial strains. **(4 Marks)**

7. Give the reasons why genes exhibit pleiotropic effects. **(3 Marks)**
8. List the types of chromosomal mutations that lead to changes in the structure of the chromosome. **(4 Marks)**
9. (a) State the blending theory of inheritance. **(1 Mark)**
(b) Why was the blending theory of inheritance discarded? **(1 Mark)**

SECTION B (40 Marks)

10. Discuss:
 - (a) The unique features of meiosis **(10 Marks)**
 - (b) The products of meiosis. **(10 Marks)**
11. Discuss the chromosomal basis of sex determination systems. **(20 Marks)**
12. Describe the modes of genetic transfer in bacteria. **(20 Marks)**
13. Discuss recombinant DNA technology in mass production of insulin. **(20 Marks)**