KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN CROP IMPROVEMENT AND PROTECTION

KST 201: PRINCIPLES OF GENETICS

DATE: TUESDAY, 27TH MARCH 2012 TIME: 2.00 P.M- 4.00 P.M

INSTRUCTIONS: Answer ALL Questions (40 marks)

1. Explain the following acronyms: DNA, mRNA, tRNA, mtDNA, ctDNA [5 marks]
2. Explain the significance of mitosis in eukaryotes and prokaryotes [5 marks]
3. List the conditions, which nullify Mendel's laws [5 marks]
4. Differentiate between hemizygous and homozygous [5 marks]
5. Differentiate among monohybrid cross, monohybrid, dihybrid cross, trihybrid cross and trihybrid. [5 marks]
6. List the gametes of the trihybrid TtYyRr [5 marks]
7. Discuss any two epistatic ratios [5 marks]
8. Describe types of induced mutations [5 marks]

SECTION B: Answer any two Question (30 marks)

9. Discuss meiosis in plants
10. In pigeons, the checkered pattern is dependent on a dominant gene C and a plan exterior on the recessive c. Red colour is controlled by a dominant gene B and brown by recessive allele b. Describe the phenotypic ratios of a cross between homozygous checkered red birds and plain brown birds in F_2 using the both **Punnett square, Forked line** and **mathematical** methods. [15 marks]

11. In a population of 80,000 individuals that is in Hardy-Weinberg equilibrium, 39,200 and 7,200 individuals are homozygous of each allele respectively.

(i) The number of heterozygote [3 marks]

(ii) The frequency of all genotypes [6 marks]

(iii) The frequency of the alleles [6 marks]

12. Write an essay on techniques used in genetic transformation in plants. [15 marks]