



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2010/2011

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

KST 207: PRINCIPLES OF MOLECULAR BIOLOGY

DATE: Monday 4th April, 2011

TIME: 8.00 am – 10 .00 a.m

INSTRUCTIONS

ANSWER ALL QUESTIONS IN SECTION A (5 MARKS EACH)

1. Define the following terms: (5 marks)
 - (a) Structural gene
 - (b) Constitutive gene
 - (c) Facultative gene
 - (d) House keeping gene
 - (e) An inducible gene
2. Briefly describe antiquated technologies giving examples. (5 marks)
3. Explain briefly the significance of capping and polyadenylation of mRNA. (5 marks)
4. Describe what determines the three-dimensional structure of protein and its significance. (5 marks)
5. Differentiate between Pribnow and TATA box. (5 marks)

6. Describe name, abbreviated name and one letter name of an amino acid giving an example and state when they are used. (5 marks)
7. Define DNA and protein sequence giving at least four examples of the subunits. (5 marks)
8. Explain briefly why DNA markers are better than morphological markers. (5 marks)

SECTION B:

*Answer any **TWO** Questions (Each 15 Marks)*

9. Discuss expression cloning. (15 marks)
10. Gene may be modulated from DNA-RNA transcription to post-translation modification of a protein. Discuss briefly. (15 marks)
11. Write short notes on
 - (a) Northern blotting (4 marks)
 - (b) Southern blotting (4 marks)
 - (c) Western blotting (4 marks)
 - (d) Eastern blotting (3 marks)
12. Assuming that the molecular mass of a protein is about 40,000 D and that of an amino acid 100 D.
 - (a) Calculate the base pairs (bp) that constitute a gene (5 marks)
 - (b) DNAs of bacteriophage contain 2×10^6 bp. Calculate the number of gene of average size (encoding protein of about 40,000 molecular weight) they contain. (10 marks)