

W1-2-60-1-6

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2013/2014**

**YEAR III SEMESTER II EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN BIOCHEMISTRY AND MOLECULAR BIOLOGY**

**HBB 2352: MOLECULAR CELL BIOLOGY**

**DATE: DECEMBER 2013 TIME: 2 HOURS**

**INSTRUCTIONS: ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS.**

QUESTION ONE

1. Explain the role(s) of different RNA – binding motifs associated with hnRNP proteins in MRNA processing. [6 marks]
2. Explain how the following techniques have been used in gene inactivation during gene function determination:
3. Transposon tagging [3 marks]
4. RNA Interference [3 marks]
5. Nuclear export of biomolecules is roughly a reverse of the import process. Explain [6 marks]
6. Describe the practical use of the following molecular markers in genomic analyses.
7. Restriction fragment length polymorphism [3 marks]
8. Randomly Amplified polymorphic DNAs [3 marks]

(e)(i) Explain the role of SARs in higher order coiling of DNA [3 marks]

(ii) Describe the bonding patterns observed during special chromosome staining

procedures. [3 marks]

**QUESTION TWO**

1. Describe the role(s) of specific RNA – binding proteins in the regulation of translation process. [6 marks]
2. Explain the application of the following techniques in genomic studies:
3. Fluorescent in situ hybridization [3 marks]
4. Radiation hybrid mapping [2 ½ marks]
5. Rearrangement breakpoints [2 ½ marks]
6. Describe types of simple sequence length polymorphisms routinely used in genomics. [6 marks]

**QUESTION THREE**

1. What is your understanding on the term DNA damage [2 marks]
2. Describe how *E.coli* has used UVR ABC system in the correction of chemical adducts on DNA strands. [10 marks]
3. Explain types of sequences with no known function found in the genomic sequence organization. [8 marks]

**QUESTION FOUR**

Clearage and polyadenylation specificity factor along with small nuclear RNAs play a critical role in the formation of mature mRNA. Discuss [20 marks]