

**W1-2-60-1-6**

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

# **UNIVERSITY EXAMINATIONS 2014/2015**

**FOURTH YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN BIOTECHNOLOGY AND MICROBIOLOGY**

**SBT 2430 : MOLECULAR BIOLOGY**

**DATE: AUGUST 2014 TIME: 2 HOURS**

**INSTRUCTIONS: ANSWER QUESTION ONE [COMPULSORY] AND ANY OTHER TWO QUESTIONS**

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**QUESTION ONE**

1. What are the problems commonly encountered during isolation of plant nuclear DNA? [4 marks]
2. Briefly describe the following
3. Telomeres [2 marks]
4. Exons [2 marks]
5. Replication forks [2 marks]
6. Simple sequence repeats (SSR) [2 marks]
7. (i) Explain the role of nuclear membrane in DNA replication [3 marks]

(ii) Describe an experimental design to distinguish genomic DNA from clonal DNA (cDNA) when studying nuclear genes encoding plastid proteins. [5 marks]

1. Explain the functions of the following compounds in plant DNA extraction
2. Β- mercaptoethanel
3. 2 – methyl-2-4- pentanediol (MPD) [2 marks]
4. Polyrinylpyrrolidone [1 mark]
5. Triton X -100 [1 mark]
6. What factors influence the success of DNA hybridization assays?[4marks]

**QUESTION TWO [20 MARKS]**

Discuss the organization of nitrogen fixation genes in Klebsiella pneumonia [20 marks]

**QUESTION THREE [20 MARKS]**

Discuss the role of plant nuclear structure in DNA replication [20 marks]

**QUESTION FOUR [20 MARKS]**

Discuss the characteristics of tumor-inducing (TI) plasmid in Agrobacterium

tumefaciens. [20 marks]