

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

**JOMO KENYATTA UNIVERSITY**

**OF**

**AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2015/2016**

**SECOND YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN GENOMIC SCIENCE/BACHELOR OF SCIENCE IN BIOSTATICS**

**SBT 2201: CELL BIOLOGY AND GENETICS**

**DATE: DECEMBER 2015 TIME: 2 HOURS**

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

**QUESTION ONE**

1. Briefly define the cell and state the cell theories. [4 marks]
2. i) Discuss the stacks of flattened hollow cavities enclosed by

membranes which are often continuous with the membranes

of the endoplasmic reticulum. [3 marks]

ii) State how vacuoles and vesicles are formed and the functions

of the cell’s central vacuole. [3 marks]

1. i) Describe the FOUR phases in the synthesis of proteins in

Eukaryotes. [4 marks]

ii) Outline and explain the structure of proteins. [2 marks]

1. i) State and explain the possible ways in which DNA is replicated.[3 marks]

ii) Briefly discuss the replication of y mitochondrial polymerase. [3 marks]

1. Discuss the regulation of DNA replication by DNA methylation. [4 marks]
2. Define the following terms:

i) Allele [1 mark]

ii) Allelic pair [1 mark]

iii) Genotype [1 mark]

iv) Homozygote [1 mark]

**QUESTION TWO**

Discuss Bacterial gene transfer mediated by a bacterial

virus (phage) vector. [20 marks]

**QUESTION THREE**

Using diagrams, discuss the following mendelian principles. [20 marks]

1. Principles of segregation
2. Principle of independent assortment
3. Principle of Dominance

**QUESTION FOUR**

Discuss numerical and structural chromosome abnormalities. [20 marks]