KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF

BACHELOR OF SCIENCE

SMR 100: CELL BIOLOGY AND GENETICS

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DATE: TUESDAY 27TH MARCH 2012 TIME: 11.00 A.M. – 1.00 P.M.

INSTRUCTIONS

SECTION A

Answer ALL questions in this section.

1. All cells share certain structural features and carry out many complicated processes in basically the same way. Explain the statement.

2. Outline the different levels of DNA packaging in chromatin and the functional elements required for replication and stable inheritance

3. Describe the molecular features of the four hierarchical levels of structure that determine the shape or conformation of a protein.

4. Distinguish between base-pairing and base-stacking with emphasis on their influences on the structural flexibility of the DNA double helix.

5. Outline the key chromosomal events during the interphase and M phase in the eukaryotic cell cycle

6. Describe briefly the events involved in transcription initiation during eukaryotic mRNA synthesis.

7. Justify the following statements:
   a) DNA replication by template polymerization is semi-conservative
   b) The genetic code is degenerate

8. Outline the process in DNA cloning.

SECTION B

Answer only one question (30 marks)

9. Discuss the cellular localization and enzyme systems involved in the complete oxidation of glucose to adenosine triphosphate

10. Describe in detail the stepwise formation of proteins on ribosome

11. Describe polymerase chain reaction paying particularly attention to the role of the primers and the temperature used during the thermal cycling.