



MACHAKOS UNIVERSITY

University Examinations 2017/2018

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FIRST YEAR SECOND SEMESTER EXAMINATION FOR DIPLOMA IN
AGRICULTURAL EXTENSION AND EDUCATION

SBT 0100: CELLULAR BASIS OF LIFE

DATE: 15/12/2017

TIME: 2.00-4.00 PM

INSTRUCTIONS

ANSWER ALL QUESTIONS IN SECTION A AND ANY OTHER TWO QUESTIONS IN SECTION B

SECTION A (COMPULSORY)

QUESTION ONE (30 MARKS)

- a) Explain the principles of the cell theory (3 marks)
- b) Discuss the meaning of the Biological concept of life (3 marks)
- c) Briefly, describe the structure and functions of lysosomes (3 marks)
- d) List the main functions of the universal cell membrane (3 marks)
- e) Describe the functions of plastids in plant cells (3 marks)
- f) Using examples, discuss the role of Biophysics in the study of Biological systems (3 marks)
- g) Explain the meaning of cell specialisation and multicellularity (3 marks)
- h) Highlight the components of a nucleic acid molecule (3 marks)
- i) Explain the biological significance of meiosis (3 marks)
- j) Describe the structure and distribution of mitochondria (3 marks)

SECTION B: ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

- a) Describe the process of the scientific method (10 marks)
- b) Explain the structural differences between prokaryotic and eukaryotic cells (10 marks)

QUESTION THREE (20 MARKS)

- a) Describe the structure, distribution and functions of various cell organelles (10 marks)
- b) Discuss the mechanisms of movement of substances in and out of cells (10 marks)

QUESTION FOUR (20 MARKS)

- a) Explain the chemical and physical structure of nucleic acid molecules (10 marks)
- b) Discuss the processes of replication and transcription of DNA (10 marks)

QUESTION FIVE (20 MARKS)

- a) Highlight the similarities and differences between mitosis and meiosis (10 marks)
- b) Explain the occurrence, structure and function of mRNA, rRNA and Trna (10 marks)