



MACHAKOS UNIVERSITY

University Examinations for 2020/2021

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FIRST YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR
BACHELOR OF SCIENCE (AGRICULTURAL EDUCATION & EXTENSION)

BACHELOR OF SCIENCE (ANALYTICAL CHEMISTRY)

BACHELOR OF SCIENCE (BIOLOGY)

BACHELOR OF EDUCATION (SCIENCE)

SBT 100: CELLULAR BASIS OF LIFE

DATE: 11/8/2021

TIME: 11:00 – 1:00 PM

INSTRUCTIONS

1. Answer Question 1 (compulsory) and **any two** questions in Section B.
2. Use clean well labelled diagrams wherever appropriate.

SECTION A (COMPULSORY)

QUESTION ONE (30 MARKS)

- a) Contrast the Prokaryotic and Eukaryotic cell. (3 marks)
- b)
 - i. Highlight the postulates of “The Cell Theory”. (3 marks)
 - ii. Explain the exceptions to the cell theory (3 marks)
- c) Illustrate the lipids below:
 - i. Triglycerols (3 marks)
 - ii. Phospholipids (3 marks)
- d) Distinguish between a nucleotide and a nucleoside (3 marks)
- e) Illustrate three types of flagella in bacteria (3 marks)
- f) Describe the role of a prokaryotic ribosome (3 marks)

- g) Illustrate the formation of a peptide bond (3 marks)
- h) Describe the “crossing over” event during meiosis (3 marks)

QUESTION TWO

- a) Describe the structure and bonding in a DNA molecule (5 marks)
- b) Discuss the semi conservative DNA replication (15 marks)

QUESTION THREE

- a) Briefly discuss the role of the bacterial cell wall (5 marks)
- b) Discuss the Gram staining protocol in relation to the structure of the cell wall (15 marks)

QUESTION FOUR

- a) The prokaryotic cell is considered more primitive than the eukaryotic cell. Justify. (6 marks)
- b) Describe the mitotic cell division (14 marks)

QUESTION FIVE

Discuss the protein levels