



# Technical University of Mombasa

Faculty of Applied and Health Sciences

**DEPARTMENT OF PURE AND APPLIED SCIENCES**  
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF  
TECHNOLOGY IN INDUSTRIAL MICROBIOLOGY AND  
BIOTECHNOLOGY  
**BIMBT 12J**

**SBT 2172 : CELL BIOLOGY**

SPECIAL/SUPPLEMENTARY EXAMINATION

FEBRUARY 2013 SERIES \_\_\_\_\_ 2  
HOURS

Instructions to candidates:

This paper consist of **FIVE** questions

Answer question **ONE** (compulsory) and any other **TWO** questions

**Question ONE**

- a) Explain the functional difference between the scanning electron microscope (SEM) and the transmission Electron Microscope (TEM) **(2marks)**
- b) (i) Outline the postulates of the cell theory **(3marks)**  
(ii) State the three important events that transformed the pre-bionts into protobionts during biological evolution. **(3marks)**
- c) Explain briefly the fluid-mosaic model of the cell membrane **(4marks)**
- d) Define the following terms:-
  - (i) Symports **(1mark)**
  - (ii) Uniports **(1mark)**

- (iii) Explain how any TWO (2) membrane transport molecules aid in transmembrane transport **(4marks)**
- e) (i) Outline the difference between mitotic and meiotic cell division. **(4marks)**  
(ii) Explain the significance of the second meiotic cell division **(2marks)**
- f) (i) Explain the concept of apoptosis in cell aging **(4marks)**  
(ii) Explain the advantages of apoptosis. **(2marks)**

### **Question TWO**

- a) Explain the functional ultrastructure of the following cell organelles:-
  - (i) Endoplasmic reticulum. **(6marks)**
  - (ii) Chloroplasts **(4marks)**
- b) Describe the evolution of photosynthesis and respiration in cells. **(10marks)**

### **Question THREE**

- a) Describe TWO mechanisms of cell movements in unicellular organisms of cell movements in univertcellular organisms **(8marks)**
- b) Explain SIX (6) forces that aid in cell movement **(12marks)**

### **Question FOUR**

- a) Describe the processes involved in mitotic cell division **(12marks)**
- b) Explain the importance of mitotic cell division **(6marks)**
- c) Outline the similarities between mitotic cells division and meiosis II. **(2marks)**

### **Question FIVE**

Discuss the cell as the basic unit of life interms of functional organization. **(20marks)**