



# THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

**A. M. E. C. E. A**

**MAIN EXAMINATION**

**JANUARY – APRIL 2015 TRIMESTER**

**FACULTY OF SCIENCE**

**DEPARTMENT OF NATURAL SCIENCES (BIOLOGY)**

**REGULAR PROGRAMME**

**BIO 101: INTRODUCTON TO CYTOLOGY AND PHYSIOLOGY**

P.O. Box 62157  
00200 Nairobi - KENYA  
Telephone: 891601-6  
Fax: 254-20-891084  
E-mail: academics@cuea.edu

<b>Date: April 2015</b>	<b>Duration: 2 Hours</b>
<b>Instructions: Answer Question ONE and any other TWO Questions.</b>	

- Q1. a) State four ways in which bacteria cells differ from most eukaryotic cells. **(2 marks)**
- b) Briefly explain THREE functions of membrane proteins. **(3marks)**
- c) Give THREE adaptations of mitochondria to its function. **(3 marks)**
- d) i) Outline the steps involved in replication of viruses. **(3 marks)**
- ii) Give THREE potential benefits of stem cells. **(3 marks)**
- e) i) Briefly describe the structure of DNA. **(4 marks)**
- ii) Name the enzymes involved in DNA replication and explain the function of each in this process. **(6 marks)**
- f) i) What are the two functions of water during photosynthesis? **(2 marks)**
- ii) In what FOUR ways are the chloroplasts adapted for the process of photosynthesis? **(4 marks)**
- Q2. Describe the steps of the cell cycle and give the importance of each step during this cycle. **(20 marks)**
- Q3. Account for transport of nutrients substances in and out of the cells. **(20 marks)**

- Q4. a) Explain how bacteria cope with harsh environments and how this influences their elimination. **(15 marks)**
- b) In what FIVE ways are Gram negative bacteria different from Gram positive bacteria? **(5 marks)**
- Q5. a) Write short notes on the following specialized cells with reference to their structure, function and adaptations to their functions. **(15 marks)**
- i) Sperm cells
  - ii) Root hair cells
  - iii) Red blood cells
- b) List and briefly explain the physiology of FIVE lymphoid organs. **(5 marks)**

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