JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE & TECHNOLOGY

SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF EDUCATION SCIENCE WITH IT & BACHELOR OF SCIENCE IN BIOLOGICAL SCIENCES

1ST YEAR 2ND SEMESTER 2018/2019 ACADEMIC YEAR

MAIN CAMPUS - REGULAR

COURSE CODE: **SZL 104/SBI 3121**

COURSE TITLE: **CELL BIOLOGY**

EXAM VENUE: LR 2 **STREAM: (BED/BIO)**

DATE: 25/04/2019 **EXAM SESSION: 12.00-2.00PM**

TIME: 2 HOURS

Instructions:

1. **Answer ALL questions in Section A and Any two questions in Section B**
2. **Candidates are advised not to write on question paper**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room**

SECTION A: SHORT ANSWER QUESTIONS (30 MARKS)

1. Define the term cytosol and outline two of its functions. (3 marks)
2.
    (a) State the three tenets of the cell theory. (1.5 marks)
    (b) Explain the endosymbiotic theory and give one supporting evidence (1.5 marks)
3. Students observe that when an animal cell, undergoing mitosis, is treated with colchicine, the mitotic spindles disappear and the cell fails to divide. When the colchine is washed away, mitotic spindles reappear at the centrosome and begin to elongate. Explain the observation. (3 marks)
4. Explain three functions of the lysosome (3 marks)
5. Give three structural and three functional differences between intermediate filaments and microfilaments. (3 marks)
6. Explain the concept of membrane fluidity and give its significance. (3 marks)
7. Draw the structure of the rough endoplasmic reticulum and list 2 functions. (3 marks)
8. Outline the life cycle of the bacteriophage. (3 marks)
9. Explain how cell size is limited by its surface area to volume ratio. (3 marks)
10. Distinguish between:
    (a) COPI and COPII coated vesicles (1.5 marks)
    (b) Nucleosome and nucleolus (1.5 marks)
    (c) Peripheral membrane protein and multipass proteins (1.5 marks)

SECTION B: ESSAY QUESTIONS (40 MARKS)

11. Describe the following:
    (a) The Process of transporting material across plasma membrane by endocytosis and exocytosis (10 marks)
    (b) The steps involved in transportation of glucose across intestinal epithelium (10 marks)
12. Discuss the early models of the membrane structure, before the fluid mosaic model (20 marks)
13.
    (a) Describe the structure of the mitochondrion. (10 marks)
    (b) Outline the major steps of the tricarboxylic acid cycle. (10 marks)
14. Describe the different stages of meiosis. (20 marks)