CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE (BIO, CHEMISTRY, BIOCHEM), AGRICULTURAL EDUCATION & EXTENSION AND BACHELOR OF EDUCATION (SCIENCE)

ZOOL 232: CELL BIOLOGY

STREAMS:BSC BIO,CHEM,BIOCHEM, AGED &BED(SCI)

TIME: 2 HOURS

DAY/DATE: MONDAY 4/12/2017 **2.30 P.M- 4.30 P.M**

INSTRUCTIONS:

- **Answer all questions in section A and any other one in section B**
- **Illustrate your answer with labeled diagrams where appropriate**

SECTION A (50MARKS)

1. Explain the contribution of Theodor Schwann to the study of cell biology. [1mark]

   (b) Name the cytoplasmic organelle that perform the following functions.

   (i) Synthesis of rRNA [½ mark]

   (ii) Storage of calcium ions. [½ mark]

   (iii) Autophagy [½ mark]

   (iv) Glycosylation [½ mark]

   (c) Identify two types of peroxisomes found in plant cells and give one function of each. [2marks]

2. (a) Differentiate between a bacterial and sperm cells with respect to the following.

   (i) Motility [1mark]

(ii) Cell division [1mark]

(b) State two functions of capsule. [1mark]

(c) Explain the following terms.

(i) Nucleosome [1mark]

(ii) Transport vesicle [1mark]

3. (a) Explain three functions of central vacuole. [3marks]

(b) Outline two types of leucoplasts and give one function of each. [2marks]

4. (a) Distinguish between the following terms;

(i) Metacentric and Acrocentric chromosomes. [1mark]

(ii) Paracrine and Endocrine signaling. [1mark]

(iii) Symport and Antiport . [1mark]

(b) Outline two ways in which water is transported across the plasma membrane. [2marks]

5. (a) Explain how membrane proteins play the following roles.

(i) Transport of substances. [2marks]

(ii) Cell to cell recognition. [1mark]

(iii) Signal transduction [1mark]

(b) Explain why membrane phospholipids are amphipathic. [2marks]

6. (a) Describe the structure of microtubules. [3marks]

(b) Outline two functions of microfilaments. [1mark]

(c) Identify the types of intermediate filaments localized in the following cell types.

(i) Epithelial cell [½ mark]

(ii) Fibroblasts [½ mark]

7. (a) Draw a well labeled diagram of desmosomes. [2marks]

(b) Describe the structure of Gap junction. [3marks]

8. (a) Explain why mitochondrion is considered as autonomous cell organelle. [3marks]

   (b) State the similarities in structure of mitochondrion and chloplast. [2marks]

9. (a) Explain the meaning and significance of the term nuclear pore complex. [2marks]

   (b) Outline three functions of golgi complex. [3marks]

10. (a) Giving examples identify the process involved in secretion of biological molecules. [2marks]

    (b) Outline the features of facilitated diffusion. [2marks]

    (c) What is the name given to cluster of ribosomes active in protein synthesis. [1mark]

SECTION B (30MARKS)

11. Describe the following mechanisms.

    (a) Sodium potassium pump. [8marks]

    (b) Endocytosis. [12marks]

12. Describe the process of meiotic cell division. [20marks]
