

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**SECOND YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF
SCIENCE IN BIOMEDICAL SCIENCE AND TECHNOLOGY**

BMET 212: CELL STRUCTURE AND CELL BIOLOGY

STREAMS:

TIME: 2 HOURS

DAY/DATE: THURSDAY 13/12/2018

11.30 A.M – 1.30 P.M

INSTRUCTIONS:

- Answer question **ONE (COMPULSORY)** and any other **TWO** questions.
- Sketch diagrams may be used whenever they may help to illustrate your answer.
- Do not write anything on the question paper.
- This is a closed book exam. **No** reference materials are allowed in the examination room.
- There will be **No** use of mobile phones or any other unauthorized materials.
- Write your answers legibly and use your time wisely.

INSTRUCTION

Answer question ONE and Any other TWO question.

Do not write on this question paper.

Question One (30 marks)

1. Discuss the following terms in relation to cell division
 - a. Karyokinesis (2 marks).
 - b. Cytokinesis (2 marks).
2. Briefly describe some of the events that take place during interphase (5 marks).
3. Describe the molecular components that make up the cell membrane (4 marks).
4. Compare and contrast different types of passive transport with active transport, proving examples of each (6 marks).

BMET 212

5. Identify the 3 most important second messengers in biological systems and discuss why you think they are most important. (6 marks).
6. Briefly discuss three important properties of cancer cells. (3 marks).
7. Briefly discuss the following terms in as applied to cell biology
 - a. Tight junction (2 marks).
 - b. Gap junction (2 marks).
 - c. Plasmodesmata (2 marks).

Question Two (20 marks)

1. Briefly, describe and use a suitable diagram to illustrate the following:
 - a. Synapsis (3 marks).
 - b. Bivalent (3 marks)
 - c. Chiasmata (3 marks)
2. Why is receptor – mediated endocytosis said to be selective than phagocytosis or pinocytosis (5 marks).
3. What do osmosis, diffusion, filtration, and the movement of ions away from like charge all have in common? In what way do they differ? (6 marks).

Question Three (20 marks).

1. Briefly discuss the following biochemical disorders:-
 - a. Hartnup disease (4 marks).
 - b. Cystinuria (4 marks).
2. In relation to cell membrane composition and organization, discuss the mode of action of anesthesia (6 marks).
3. With a use of a suitable diagram, discuss the formation of a bilayer biomembranes in all cell types. (6 marks).

Question Four (20 marks)

4. With a use of a diagram, demonstrate the formation of phospholipids. Discuss all components of phospholipid. (6 marks).
5. Discuss the major differences between a normal cell and a cancerous cell. (4 marks)

BMET 212

4. Discuss various signaling modes used for intercellular communication (5 marks)
 5. Discuss major changes that occur in the cell during apoptosis (5 marks)
 6. Briefly explain why mitosis is called equational division. (2 marks).
 7. Identify the stage of cell cycle at which one of the following events occur:
 - a. Chromosomes are moved to spindle equator (1 mark).
 - b. Centromere splits and chromatids separate (1 mark).
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