



# **MAASAI MARA UNIVERSITY**

**REGULAR UNIVERSITY EXAMINATIONS  
2022/2023 ACADEMIC YEAR  
THIRD YEAR SECOND SEMESTER**

**SCHOOL OF EDUCATION  
B. ED (SCIENCE)**

**COURSE CODE: ECI 3119-1:  
COURSE TITLE: SPECIAL METHODS IN BIOLOGY**

**DATE: 8<sup>TH</sup> DECEMBER, 2022**

**TIME: 1100-1300**

**INSTRUCTIONS TO CANDIDATES**

Question ONE is compulsory

Answer any other TWO questions

### QUESTION ONE (Compulsory)

- a) Discuss the meaning and application of the following concepts in teaching and learning Biology according to Vygotsky's Social-Cultural Development Theory (6 Marks).
- Role of social interaction in cognitive development
  - The more knowledgeable others (MNO)
  - Zone of Proximal Development (ZPD)
- b) Explain the three literacy skills in the 21<sup>st</sup> Century Skills and how they apply in teaching and learning of Biology (6 Marks)
- c) Discuss four teaching approaches that you would advocate for teaching a Biology Competency Based Curriculum (8 Marks)

### QUESTION TWO

- a) Explain the following terminologies as applied in teaching of Biology. In an class experiment to investigate effects of heat on enzymatic reactions, student observed that the rate of enzymatic reactions increased upto a certain temperature before it started dropping. (3 Marks)
- b) Formulate an hypothesis, a law and a theory based on students observations on effects of temperature on enzymatic reactions. (6 Marks)
- c) Discuss any three implications on teaching and learning based on teachers' perception of science as the process of acquiring and refining knowledge about the Universe. (6 Marks)

### QUESTION THREE

- a) Explain the following terminologies as applied in teaching of Biology.
- Teaching Approach
  - Teaching Method
  - Teaching Strategy
  - Teaching Technique (8 Marks)
- b) Identify seven teacher-based factors, that may influence the quality of learning in a Biology lesson. (7 Marks)

### QUESTION FOUR

- a) Giving 7 points, discuss why inquiry/problem solving method of teaching Biology is important in the 21<sup>st</sup> Century teaching and learning. (7 Mark)
- b) A Biology lesson plan topic is "**Factors influencing rate of photosynthesis**". Based on the provided topic, formulate the following.
- Two expected learning outcomes
  - Two teacher activities
  - Two learning activities
  - Two assessment question (8 Marks)

### QUESTION FIVE

- a) Explain the **seven** roles of a laboratory technician. (7 Mark)
- b) Discuss four facilities that should be provided when designing a science laboratory. (8 Marks)

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