



*(Knowledge for Development)*

# **KIBABII UNIVERSITY**

**UNIVERSITY EXAMINATIONS**

**2022/2023 ACADEMIC YEAR**

**THIRD YEAR FIRST SEMESTER**

**MAIN EXAMINATION**

**FOR THE DEGREE BACHELOR OF EDUCATION (ARTS) &  
BACHELOR OF EDUCATION (SCIENCE)**

**COURSE CODE:** ESM 311

**COURSE TITLE:** MATHEMATICS EDUCATION

**DATE:** 20<sup>th</sup> DECEMBER 2022

**TIME:** 2.00 – 4.00PM

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## **INSTRUCTIONS TO CANDIDATES**

Answer Question One and any other TWO Questions

TIME: 2 Hours

This Paper Consists of 3 Printed Pages. Please Turn Over.

### QUESTION ONE

- a) Explain any **four** guidelines for effective use of selected teaching/ learning aids in Mathematics (4mks)
- b) Briefly explain any **four** benefits of learning Mathematics education (4mks)
- c) Identify the **five** necessary considerations in designing an end of term examination in Mathematics. (5mks)
- d) When scheming for Mathematics, several factors are considered. Explain any **three** of these factors. (3mks)

- e) Using specific examples explain **three** ways through which learning of Mathematics contributes towards achieving social goals of education (3mks)
- f) Using the concept of "volume of a cylinder", construct an instructional objective. (2mks)

- g) Expository methods are discouraged in teaching and learning. Give **three** ways to justify their continued use in Mathematics lessons. (3mks)

- h) By giving examples briefly explain any **three** benefits of a Mathematics teacher having knowledge of the different psychological theories (6mks)

### QUESTION TWO

- a) By giving examples, briefly explain any two benefits of Mathematics teacher having knowledge of different philosophies in Mathematics (4 marks)
- b) Differentiate between
- (i) Formative and summative evaluation (2mks)
- (ii) Assessment and evaluation (2mks)

- c) Describe the **four** main steps in a Mathematical lesson presentation. (4mks)

- d) One Heuristic approach to teaching and learning of Mathematics is project method.

- (i) Describe how one would use the project method to introduce the topic on statistics in a form two class. (4mks)

- (ii) State **two** merits and **two** demerits of the project method in teaching and learning of Mathematics. (4mks)

### QUESTION THREE

- a) Explain any **four** ways on how a teacher would use the computer as a teaching and learning resource during the Mathematics instructional process (8 marks)
- b) State and explain the **three** characteristics of a good Mathematics instructional objective (6 marks)
- c) State and explain any **three** aspects of the Mathematics syllabus and teaching recommendations for Mathematics that have been informed by Jean Piaget's psychological theory (6mks)

### QUESTION FOUR

- a) Explain **three** ways in which teaching/ learning resources influence effective teaching and learning of Mathematics in secondary schools (6mks)
- b) Explain giving examples **three** ways through which formative evaluation in Mathematics can improve the teaching and learning process (6mks)
- c) Highlight **four** problems associated with evaluation of Mathematics learning and suggest ways of reducing or eradicating them. (8mks)

### QUESTION FIVE

- a) Identify and discuss any **three** factors that informed the change of Mathematics curriculum from traditional Mathematics to new or modern Mathematics. (9 mks)
- b) Explain giving examples **two** ways in which the Mathematical philosophy or view held by a teacher influences his/her choice of teaching methods. (8 mks)
- c) Explain giving specific example how instructional objectives influence the choice of instructional resources to be used in class. (3 mks)