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*(Knowledge for Development)*

**KIBABII UNIVERSITY**

**UNIVERSITY EXAMINATIONS**

**2022/2023 ACADEMIC YEAR**

**THIRD YEAR FIRST SEMESTER**

**SUPPLEMENTARY/SPECIAL EXAMINATION**

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

**COURSE CODE: ESM 311**

**COURSE TITLE: MATHEMATICS EDUCATION**

**DATE: 17<sup>TH</sup> AUGUST 2023**

**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 the key distinction between mathematics and mathematics education (2 mks)
- (b) Briefly explain by giving an example the value of a mathematics teacher having an understanding of the history of mathematics. (3 mks)
- (c) Explain three differences between absolutist and dynamic views of mathematics. (3 mks)
- (d) Briefly explain the reasons why it's important for a teacher to set an instructional objective. (3 mks)
- (e) Explain giving specific examples any two learner factors that can promote or hinder the use of discussion method in class. (4 mks)
- (f) Explain three distinctions between formative and summative evaluation. (3mks)
- (g) Discuss the professional value of maintaining the following documents by a mathematics teacher.
  - (i) Analysis of test results (1mk)
  - (ii) Learners' progress records (2mks)
  - (iii) Record of work covered (2mks)
- (h) Explain four factors for effective use of an audio – visual material. (4mks)
- (i) Jerome Bruner argues that child's development does not involve a series of stages but rather mastery of three modes of representation called modes. Identify and explain the three modes. (3mks)

### QUESTION TWO

Discuss the contribution of Robert Gagne to the development of the current mathematics curriculum in Kenya (20 marks)

### QUESTION THREE

- (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)

#### QUESTION FOUR

(a) Differentiate between the following:

- (i) Formative and summative evaluation (2mks)
- (ii) Assessment and Evaluation (2 marks)
- (iii) Test and measurement (2 marks)
- (iv) Objective and subjective test (2 marks)

(b) Identify the Key characteristics of a good test and describe the process of test preparation in mathematics (12 marks)

#### QUESTION FIVE

- a) Teaching and learning resources are essential in the mathematics instructional process
- (i) Describe any **THREE** attributes of a good mathematics textbook as an instructional resource (6 marks)
  - (ii) Highlight any **TWO** reasons that justify the chalkboard as the commonly used instructional resource in Kenyan schools (2 marks)
- b) Most mathematics teachers in Kenyan schools perceive the lecture method as essential during the instructional process
- (i) Explain any **THREE** circumstances under which this method is useful in the instructional process (6 marks)
  - (ii) State any **THREE** limitations associated with this method in the instructional process (3 marks)
  - (iii) Suggest any **THREE** ways a teacher may vary the stimulus during the instructional process (3 marks)

END