MACHAKOS UNIVERSITY

University Examinations 2019/2020

SCHOOL OF EDUCATION

DEPARTMENT OF COMMUNICATION TECHNOLGY

THIRD YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF EDUCATION (SPECIAL NEEDS)

BACHELOR OF EDUCATION (SCIENCE)

BACHELOR OF EDUCATION (ARTS)

ECT 302: MATHEMATICS TEACHING METHODS

DATE: 16/11/2020   **TIME: 2:00 – 4:00 PM**

INSTRUCTIONS: Answer Question One and Any Other Two

QUESTION ONE (COMPULSORY) (30 MARKS)

a)   Explain five reasons why teaching and learning resources are important during

a mathematics lesson   (10 marks)

b)   Explain each of the five types of mathematical knowledge, that the secondary school

mathematics curriculum exposes to students.   (10 marks)

c)   Discuss five limitations of the secondary school mathematics syllabus in the 8-4-4 system
of Education.   (10 marks)

QUESTION TWO (20 MARKS)

a)   Explain four reasons of testing learners in mathematics.   (4 marks)

b)   Explain the circumstances under which a mathematics teacher may result to using the

following approaches:

i)   Expository approach

ii)   Discovery approach   (6 marks)

c)   Explain George Polya's heuristics of problem solving.   (10 marks)

QUESTION THREE (20 MARKS)

a)   Discuss the importance of Bruner's stages of teaching mathematical

       concepts to the leaner.   (6 marks)

b)   Assume you are teaching the subtopic 'proof of perpendicularity using gradients',
       i)   Write one objective in each of the following domains;
                  Cognitive domain
                  Psychomotor domain
       ii)   List two learning activities that may help the learner to interact with the
                  content
       iii)   Write two learning resources that are relevant.   (6 marks)

c)   State two differences between each of the following instructional theories as used in
       the context of teaching mathematics.

          i) Constructivism

          ii) Behaviorism   (8 marks)

QUESTION FOUR (20 MARKS)

a)   Outline five aims of teaching Mathematics.   (5 marks)

b)   Explain five guiding factors in choosing a mathematics class text.   (5 marks)

c)   Explain the rationale for problem solving in the teaching and learning of mathematics.
                                                                                                        (10 marks)

QUESTION FIVE (10 MARKS)

 a)   Explain five reasons why it is important for a mathematics teacher to prepare schemes of
        work.   (10 marks)

b)   Show the steps that you would follow to lead learners to discover that

       the matrix $\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$ describes quarter turn rotation about the origin   (10 marks)