



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF EDUCATION

ECT 302: MATHEMATICS METHODS

DATE: Monday, 26th March, 2012

TIME: 2.00 p.m. – 4.00 p.m.

INSTRUCTIONS:

Answer question **ONE** and any other **TWO**.

QUESTION ONE (COMPULSORY)

- a) What is Mathematics? Describe the nature of mathematics as prescribed by Aristotle. (8 marks)
- b) Explain the different models of fractions as encountered in secondary school course. Discuss difficulties encountered by students as they continue to encounter these fraction models during their learning experiences (8 marks)
- c) Use a diagram to represent the following identify
 - i) $(a+b)^2 = a^2 + 2ab + b^2$
 - ii) $(a-b)^2 = a^2 - 2ab + b^2$(8 marks)
- d) The scheme of work and lesson plans are important documents in teaching mathematics. Discuss. (6 marks)

QUESTION TWO

Theories of learning mathematics include behaviorism, Socio-Cognition, information processing and constructivism. Discuss the principles that each theory focuses on as foundational in explaining how learning occurs. (20 marks)

QUESTION THREE

- a) Explain why every Mathematics lesson should end with an assignment?
(5 marks)
- b) Distinguish between diagnostic and prognostic tests in Mathematics?
(5 marks)
- c) Suppose you set the following problem in your end term examination “identify the wanted region that satisfies the inequalities
a) $y > 2x + 2$ and $y < -x^2 + x + 6$ ”
Prepare a possible marking scheme for the problem (10 marks)

QUESTION FOUR

- a) List any four resources other than the mathematics textbook that can be used to teach mathematics (4 marks)
- b) Discuss the mathematics teachers role as regards the use of the textbook as a teaching/learning resource. (8 marks)
- c) Discuss any two advantages and two disadvantages of using calculators in teaching/learning of secondary school mathematics. (8 marks)

QUESTION FIVE

- a) How would you use the Vann Hiele levels of spatial development to teach a geometry topic from secondary school syllabus such as “*finding an angle between two planes*” (12 marks)
- b) **EITHER**
- i) Discuss with justification the introduction of mathematics alternative B for mathematically challenged learners at secondary school level in Kenya.

OR

- ii) Draw a number line to demonstrate the sum of the following directed numbers
- i) $-5 - 8$;
- ii) $9 + 6$
- iii) $3 - 8$

(8 marks)