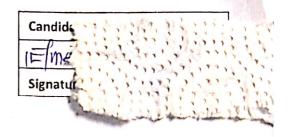
OCTOBER 2023
EMA 335SW
DEVELOPMENT OF INSTRUCTIONAL
MATERIALS IN MATHEMATICS
1 HOUR 30 MINUTES



## UNIVERSITY OF CAPE COAST COLLEGE OF EDUCATION STUDIES SCHOOL OF EDUCATIONAL DEVELOPMENT AND OUTREACH INSTITUTE OF EDUCATION

FIVE-SEMESTER BACHELOR OF EDUCATION (SANDWICH) PROGRAMME LEVEL 350, END-OF-SECOND SEMESTER EXAMINATION, OCTOBER 2023

3<sup>RD</sup> OCTOBER 2023

DEVELOPMENT OF INSTRUCTIONAL MATERIALS IN MATHEMATICS

9:30 AM - 11:00 AM

SECTION B

Answer any TWO questions from this Section.

Please, note that if you answer more than two questions, only the first two will be marked.

a. Outline five characteristics of Van Hiele's model of geometric thinking. [5 marks]
 b. Explain the five phases of Van Hiele's model of geometric thinking. [15 marks]

2.
a. What is a Professional Learning Network (PLN)? [4 marks]

b. State the **two** types of *Professional Learning Network* (PLN) and give **onc** example in each case. [6 marks]

c.
i. Draw algebra tiles to model how you would simplify the algebraic expression  $x^2 - 4x + 2x^2 + 2x$ . [5 marks]

ii. Use the multi-base blocks to convert 5410 to a base 5 numeral. [5 marks]

- a. Define the term *manipulative in mathematics* according to the words of Karol (1991).
  - [3 marks]
- b. Explain any three pedagogical criteria for selecting mathematical manipulatives.
  - [9 marks]

- c.
- i. Define mathematical games according to the words of Oldfield (1991). [4 marks]
- ii. Give two importance of using games in the mathematics classroom.
- [4 marks]

- 4. Explain how you would guide JHS pupils to:
  - a. use Dienes Multi-base blocks to convert 311 to a base five numeral.
- [8 marks]

b. use algebra tiles to solve the equations:

i. 
$$x + 2 = 3$$

[6 marks]

ii. 
$$x^2 + 3x = -2$$

[6 marks]