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

Candid
IE/ma
Signatu

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

3RD OCTOBER 2023 DEVELOPMENT OF INSTRUCTIONAL MATERIALS IN MATHEMATICS 9:30 AM - 11:00 AM

SECTION B
[40 MARKS]

Answer any TWO questions from this Section.
Please, note that if you answer more than two questions, only the first two will be marked.

1.
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 **one** 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 54_{10} to a base 5 numeral. **[5 marks]**

3.

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]**

154.
10 R 4
2 R 0
0 R 2