

DECEMBER 2021  
EMA 335SW  
DEVELOPMENT OF INSTRUCTIONAL  
MATERIALS IN MATHEMATICS  
1 HOUR, 30 MINUTES

CANDIDATE'S INDEX NUMBER:

IE/MAT/ARR/19/0103

SIGNATURE:

*[Signature]*

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-FIRST SEMESTER EXAMINATION, DECEMBER, 2021

DECEMBER 22, 2021

DEVELOPMENT OF INSTRUCTIONAL  
MATERIALS IN MATHEMATICS

9:30 AM - 11:00 AM

SECTION B  
[40 MARKS]

Answer any TWO questions in this section. Each question carries 20 marks.

✓ 1.

- a. Define the term *manipulative in mathematics* according to Karol (1991). [3 marks]
- b. Explain any **three pedagogical criteria** for selecting mathematical manipulatives. [9 marks]
- c. i. Define *mathematical game* according to Oldfield (1991). [4 marks]  
ii. Give **two** importance of using games in the mathematics classroom. [4 marks]

✓ 2.

- a. What are *virtual manipulatives*? [2 marks]
- b. State **three** advantages and **three** disadvantages each of virtual manipulatives in mathematics education? [6 marks]
- c. State **three** applicative uses of virtual manipulatives in mathematics education. [6 marks]
- d. In the technological world and for that matter in the field of mathematics education, computers can be used in three different ways in the teaching and learning process. Explain any **two** out of three different ways of using computers in mathematics education [6 marks]

3.

- 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]

4.

a. Below is an Excel spread-sheet showing marks obtained by ten students in a class

	A	B	C	D	E	F	G	H
1	Name of student	Quiz 1 (100)	Quiz 2 (100)	Sub-total (40)	Exams (100)	60%	Total (40 + 60)	GRADE
2	Kwame	70	80		60			
3	Kwesi	60	73		49			
4	Nyankomago	82	73		78			
5	Kelechi	64	73		69			
6	Aggrey	43	64		58			
7	Yakubbu	67	72		69			
8	Mensah	54	64		69			
9	Ampem	63	73		83			
10	Donkor	73	83		63			
11	Essuman	83	71		75			
12	Essien	77	63		70			

Write an instruction in column:

- i. D that would command Excel to convert the quiz marks to 40%. [3 marks]  
Use the auto-fill to complete the rest of the column D.