APRIL 2022
EMA 312SW
SECONDARY SCHOOL MATHEMATICS CURRICULUM
1 HOUR 30 MINUTES

Candidate's Index Number
IE/MAT/AKR/19/0103
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 400, END-OF-FIRST SEMESTER EXAMINATION, APRIL 2022

APRIL 28, 2022 **SECONDARY SCHOOL MATHEMATICS CURRICULUM** **9:30 AM - 11:00 AM**

SECTION B
[60 marks]

Answer any TWO questions from this Section.

1.

a. Explain the difference between *vertical* and *horizontal* sequencing of subject matter in mathematics. **[8 marks]**

b. Amankwa tosses a coin twice. Draw a tree diagram to show all possible outcomes. **[6 marks]**

c. From your tree diagram in (b), list the sample space. **[4 marks]**

d. Use your tree diagram in (b) to find the probability of obtaining:
   i. 2 heads, **[6 marks]**
   ii. a head or a tail in any order. **[6 marks]**

2.

a. Explain the difference between *mathematical error* and *misconception*. **[6 marks]**

b. Josephine is a Senior High School (SHS 1) student. She performs the following tasks as follows. Identify and explain the root causes of her error and misconception for each task.

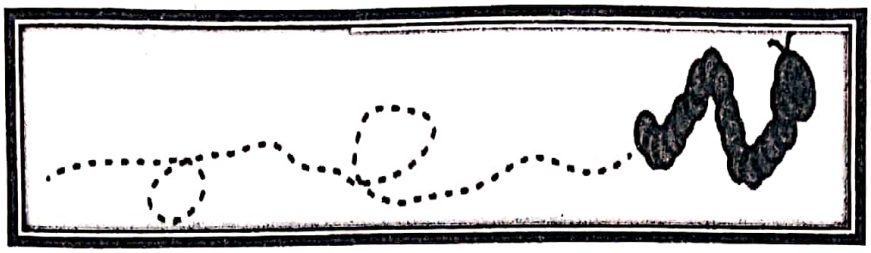
   i. $(a+b)^2 = a^2 + b^2$ **[6 marks]**

   ii. $3x + 5 = 8x$ **[6 marks]**

c. How does the surface area of a square change when the side length is tripled? Show your reasoning by using *algebraic* and *geometric* approaches. **[12 marks]**

$(a-b)^2$
$a^2 - 2ab + b^2$

3. A caterpillar is crawling around on a piece of graph paper, as shown below.



a. If you wish to determine the caterpillar's location on the paper with respect to time, would this location be a function of time? Why or why not? **[6 marks]**

b. Illustrate **one** approach you would use to explain the *concept of a function* to Senior High School (SHS1) students without resorting immediately to heavy abstractions or unfamiliar vocabulary.

[6 marks]

c. Explain **three** misconceptions students commonly have about functions? **[9 marks]**

d. Give **one** example or counterexample you can present to help students confront each of the misconception you stated in 3(c)? **[9 marks]**