

JUNE 2023
EMA 212SW
PEDAGOGICAL CONTENT KNOWLEDGE IN
MATHEMATICS
1 HOUR 30 MINUTES

Candidate's Index Number
Signature: <i>[Handwritten Signature]</i>

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 EXAMINATIONS, JUNE 2023

19TH JUNE 2023 PEDAGOGICAL CONTENT KNOWLEDGE IN 7:30 AM - 9:00 AM
MATHEMATICS

SECTION B
(40 MARKS)

Answer any TWO questions from this Section.

1.
 - a. Explain **three** teacher practices that are very helpful in reducing students' mathematics anxiety. [6 marks]
 - b. Explain the **six** major steps in guiding senior high school students to calculate the standard deviation of **8, 12, 13, 14, 15, 17, 19**. [14 marks]

2.
 - a. Explain each of the following guidelines for teaching mathematics:
 - i. Teacher reflections;
 - ii. Being an answer machine;
 - iii. Being a self-motivated life-long learner. [6 marks]
 - b. Describe, step-by-step, illustrating with diagram(s) how you would use algebra tiles to expand and simplify $(x + 2)(x + 5)$. [14 marks]

3.

- a. Explain the *Three-Part Lesson Format* for teaching mathematics. Your explanation should include the principle that underpin the format. [10 marks]
- b. Explain the steps you would take high school learners through to inductively derive the formula, $\bar{x} = \frac{\sum x}{n}$, for finding the arithmetic mean of simple raw data. Indicate clearly what each variable or symbol in the formula stands for. [10 marks]

4.

- a.
- i. What is meant by *transformation* as a component of Shulman's Model of Pedagogical Reasoning? [2 marks]
 - ii. Explain the **five** sequential processes of the transformation component. [10 marks]
- b. Explain the following suggested techniques for motivating students to learn mathematics.
- i. Call attention to a void in students' knowledge
 - ii. Present a challenge
 - iii. Get students actively involved in justifying curiosities
 - iv. Use recreational mathematics. [8 marks]