



UNIVERSITY OF EDUCATION, WINNEBA
INSTITUTE FOR TEACHER EDUCATION AND
CONTINUING PROFESSIONAL DEVELOPMENT
(ITECPD)



END OF FIRST SEMESTER EXAMINATIONS APRIL 2022

COURSE CODE: EGM 114

COURSE TITLE: LEARNING, TEACHING AND APPLYING NUMBER AND ALGEBRA

TIME ALLOWED: 60 MINUTES

STUDENT'S INDEX NUMBER:

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- This paper is made up of four essay type questions.
- Answer TWO questions in your answer booklet.
- Each question carries equal marks. You are expected to start each question from a new page.
- You are expected to handover your answer booklet to the invigilator before you leave the examination hall.

SECTION ONE

- The functions f and g are defined on the set of real numbers by $f: x \rightarrow 2x + 3$ and $g: x \rightarrow 3x - 1$.
 - A teacher made a claim that $f \circ g(x) \neq g \circ f(x)$. As a student teacher, explain whether or not this claim is correct. (4 marks)
 - A number was expressed in base five as 3123_{five} . What is the same number given in $(\text{mod } 5)$? (3 marks) *same*
 - Given that x is a real number, solve for the value of x and represent your answer on a number line from the inequality $\frac{2}{3}x - \frac{x}{3} + \frac{x}{2} < 5$ (3 marks) *413(mod 5)*
- If $n(A \cap B) = 2$, $n(A \cap B') = 14$ and $n(A' \cap B) = 12$.
 - find $n(B)$ (3 marks)
 - The sum of the ages of a mother and her son is 46 years. In four years' time, the ratio of their ages will be 7: 2. Find their present ages. (4 marks)
 - Write the rational number $0.\dot{5}$ in the form $\frac{x}{y}$ where x and y are real number such that $y \neq 0$. (3 marks)

3. In his will, a father left an estate worth GH¢76,000,000.00. Out of this, GH¢16,000,000.00 was reserved for various purposes. The rest of the amount was shared among his three children. The oldest son received 20% of the amount. The remaining amount was shared between the other son and the daughter in the ratio 3:2 respectively. Calculate, the

- a. amount that the oldest son received; (3 marks)
- b. amount that the daughter received; (4 marks)
- c. difference between the amounts the two sons received. (3 marks)

4. a. In about three sentences, describe the closure property of sets, with an example. (4 marks)

- b. Identify the operations which would make the set of integers closed. (3 marks)
- c. Two student teachers in a discussion, argued that a counting numbers are rational numbers but not all rational numbers are counting numbers. Using the theory of sets, illustrate the relationship between the two sets of numbers. (3 marks)

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