NOVEMBER 2023
EBS 417
MATHEMATICAL INVESTIGATIONS
1 HOUR 30 MINUTES

Candidate's Index Number
Signature:

UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
SCHOOL OF EDUCATIONAL DEVELOPMENT AND OUTREACH
INSTITUTE OF EDUCATION

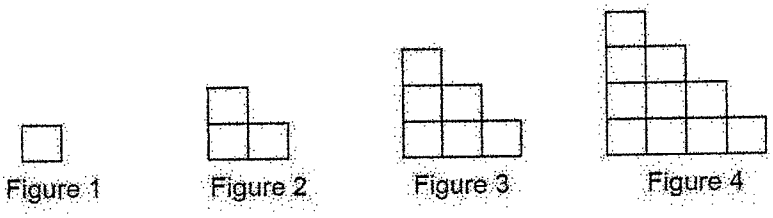
COLLEGES OF EDUCATION
FOUR-YEAR BACHELOR OF EDUCATION (B.ED)
FOURTH YEAR, END-OF-SECOND SEMESTER EXAMINATION, NOVEMBER 2023

9TH NOVEMBER 2023 MATHEMATICAL INVESTIGATIONS 9:30 AM – 11:00 AM

SECTION B
[40 MARKS]

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

1. Study the figures below and use it to answer the questions that follow.



a. Find the number of blocks needed to form the 5th figure. **[2 marks]**

b. Determine the formula for finding the number of blocks needed for the ***nth*** figure, clearly indicating each of Polya's processes you are using in each stage. **[12 marks]**

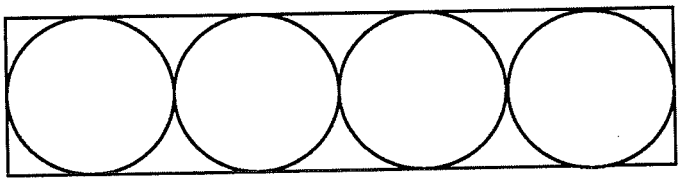
c. Explain any **three** benefits that can be derived by teaching through problem-solving. **[6 marks]**

2.

a. Find the values of A, B and C $(A \neq B \neq C)$ such that the operation below is true. **[3 marks]**

$$\begin{array}{ccc} 5 & A & 2 \\ -3 & 5 & B \\ \hline C & 7 & 6 \end{array}$$

b. Four identical circles are inscribed in a rectangle as shown below.



If the length of the rectangle is 96cm, find the distance between the centres of the two end circles at the ends of the rectangle. **[8 marks]**

c. Explain any three reasons why teaching *for* problem-solving would not help students understand mathematics concepts. **[9 marks]**

3.

a. Explain **four** roles of the mathematics teacher in helping students to develop problem-solving skills. **[8 marks]**

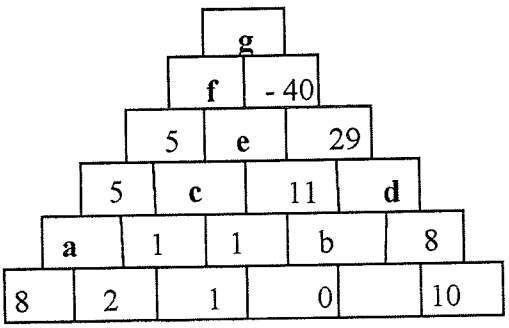
b. List any **four** strategies that can be employed by a class six pupil when solving a mathematics problem. **[4 marks]**

c. A farmer has only goats and hens in his farm. On a particular day he sold 12 animals (goats and hens) and the total number of their legs was 32. How many goats and how many hens did he sell that day? **[8 marks]**

4.

a. Mr Mensah is planning a road trip from City A to City B, which are 300 miles apart. He wants to drive at an average speed of 60 Km per hour for the first half of the trip and then increase his speed to an average of 75 Km per hour for the second half of the trip. How many hours will it take Mr Mensah to complete the entire trip? **[10 marks]**

b. Study the pattern displayed. Find the values of the letters. **[6 marks]**



c. Place each of the digits 1, 2, 3, 4, 5, 6, 7 and 8 in separate boxes so that boxes that share common corners do not contain successive digits. **[4 marks]**