Candidates' Name: .....

School: .....Signature:.....

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MATHEMATICS
JULY/AUG 2026
2¼ HOURS

PROVINCIAL EXAMINATIONS AGENCY (PEA)
COUHEIA MOCK EXAMINATIONS 2026

Uganda Certificate Of Education
MATHEMATICS
TIME: 2 HOURS 15 MINUTES

INSTRUCTIONS TO CANDIDATES:

- *This examination paper has* **two** *sections;* **A** *and* **B**. *It consists of* **six** *items.*
- *Section* **A** *has* **two compulsory** *items.*
- *Section* **B** *has* **two** *Parts;* **I** *and* **II**. *Respond to* **one** *item from each part.*
- *Respond to* **four** *examination items in all.*
- *Any additional item(s) responded to will* **not** *be scored*
- **All** *responses* **must** *be written in the answer booklet(s) provided.*
- *Graph Paper is provided.*
- *Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used.*

SECTION A

Respond to **both** *items in this section.*

ITEM ONE

A senior four leaver wants to start a poultry project and she has bought 48 broilers, 60 layers and 72 local chickens (birds). But her parents advised her not to mix up these birds so she has to put an equal number of birds in the different rooms. She does not know the highest number of birds she can put in each room. She also needs to feed the birds with a mixture of maize feed but she does not know how it can be done. When she approached her friend Ritah who is an expert in poultry, she gave her a formula in the form $\frac{4+\sqrt{2}}{2-\sqrt{2}}$ in which she needed to first simplify it to its simplest form of $a + b\sqrt{2}$ so that she could obtain the mixing ratio $a:b:2$ of the birds feeds. She did not know on how this can be achieved. Later on, she went abroad and left four million one hundred twenty-five thousand Uganda shillings to her mother. She instructed her to use only **0.454545.....** for family expenses and reinvest the balance in their poultry project.

Task;

a) Help this senior four leaver to know the highest equal number of birds he can put in each room without mixing them.

b) Also help her to understand the formula for mixing the feeds by calculating the mixture ratios.

c) Determine the fraction of the amount of money for family use and the money her mother will reinvest in the poultry project.

ITEM TWO

A school compound club is planning to work on its compound pathways in form of two straight lines. The first pathway follows the line $4y - 3x + 2 = 0$ and the second pathway must be parallel to the first pathway passing through the point (8,5). The school compound club is also planning to make a third pathway perpendicular to the first pathway. This third pathway must pass through (0,7) and the club will put it only if its y-intercept is greater than 4. The compound club patron wanted to reward the club members and went to town to buy scholastic materials for them after working on the compound. On reaching town she found out that there was a go back to school promotion where materials were sold in groups so she could not buy one item. She was informed that a ruler and

a set together cost ugx5000 and the cost of 3 sets and 2 rulers is ugx11000. The patron wants to buy 8 rulers and 6 sets for all the club members and she has a budget of ugx40000, she is wondering if this amount is enough. The school compound patron also manages the school bakery and she is struggling to represent the bakery's production constraints on a graph. The bakery produces two types of bread loaves and buns. Each loaf costs ugx2000, and each bun costs ugx1000. The bakery has a daily budget of ugx100000 that cannot be exceeded and in addition the bakery must produce 20 pieces of bread to meet customer demand. The patron wants to put them on a graph but has no idea on how to represent them as inequalities.

Task;

a) Help the patron to come up with the equations of the second and third pathways and also advise her on whether they should put the third pathway.

b) Help the patron to know how much each set and each ruler costs.

c) Will her budget be enough for the items she wants to buy?

d) Help the patron to represent the constraints on a graph and find the region that satisfies the conditions.

SECTION B

This section has **two** *parts;* **I** *and* **II**

Part I

Respond to **one** *item from this part.*

ITEM THREE

Malvin earns a profit of shs 500, shs 1000 and shs 2000 on each glass of juice of 250ml, 300ml and 400ml sold respectively. Given that in week one she sold the following number of glasses of juice in different flavors as listed below:

Watermelon: 10 glasses of 250ml, 15 glasses of 300ml and 12 glasses of 400ml.

Passion: 15 glasses of 250ml, 20 glasses of 300ml and 30 glasses of 400ml.

Beat root: 5 glasses of 250ml, 4 glasses of 300ml and 2 glasses of 400ml.

In week two she made the following:

Watermelon: 20 glasses of 250ml, 30 glasses of 300ml and 24 glasses of 400ml.

Passion juice: 30 glasses of 250ml, 40 glasses of 300ml and 60 glasses of 400ml.

Beat root: 10 glasses of 250ml, 8 glasses of 300ml and 4 glasses of 400ml.

She needs to determine whether there was improvement in business performance or not given that in the previous two weeks she had earned a total profit of shs 200,000.

Task:

By arranging data in rows and columns, help Malvin to determine whether there was improvement in business performance or not.

ITEM FOUR

The games department of a certain girl's school has bought 5 netballs and 3 footballs and these balls are being picked from the bag by the games prefect randomly without replacing them. The games prefect is to pick 2 balls but she is not sure of the type of balls she will pick. The games department still has a choice of three games football (F), Netball(N) and volleyball(V). It was found that 40 played football, 35 played netball and 60 played volleyball; 7 played Football and Netball, 10 played Netball and Volleyball and 4 played Football and Volleyball; 34 played no game at all. If there are 150 girls in the school.

Task;

a) Help the games prefect to find the probability of selecting;
   i) Two netballs.
   ii) One football and one netball.

b) Help the games department to know the;
   i) Number of girls who played all the three games.
   ii) Number of girls who played only one game.
   iii) Number of girls who played at most two games.

c) Probability that a girl chosen at random from this school plays two games only.

Part II

Respond to **one** *item from this part.*

ITEM FIVE

KCCA graphics team is working on a new triangular logo graphically with coordinates $A(3,1)$, $B(5,1)$ and $C(5,3)$ with an area $2cm^2$ but they are challenged with the process of finding the matrices of transformation and the area of the final images. First, they need to reflect the triangle across the line

$Y = X$ and then enlarge it by scale factor 2. After these transformations, they want to determine the matrix that will return this transformed triangle to its original position. Additionally, they need to know the coordinates of every transformed triangle at each stage. Another graphics team decided to sketch the triangular logo using a ruler and pair of compasses only by construction having points ABC where $BC = 8cm$, $AC = 12cm$ and angle $ABC = 105°$. On this figure they want to put point D which is equidistant from A and B. If D is on the same side of AB as C and angle $ADC = 90°$.

Task;

a) Help this team graphically with the process and find the required matrices along with the coordinates of the images.

b) Also determine the area of the transformed triangles.

c) show the exact position of D on your diagram and find length of;

i) AB

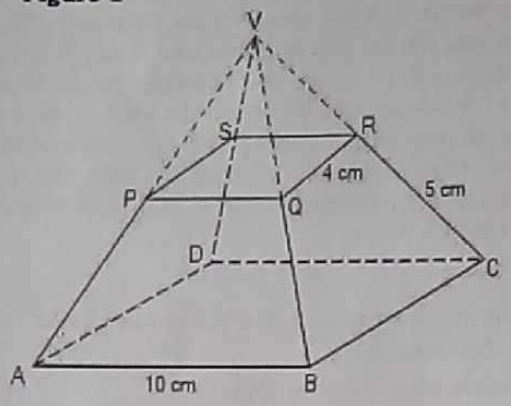
ii) AD

iii) DC

ITEM SIX

A community SACCO wants to construct saving boxes for each member in form of a pyramid lamp shed ABCDPQRS as shown in the figure below. The base ABCD should be a square of side 10cm long and the top, PQRS is also a square of side 4cm and each of the short edges of the saving box is 5cm. The SACCO members have to save until the box is full with coins of 500ugx only. And it is estimated that the coin has a diameter of 2.2cm and 0.2cm high. One of the members wanted to find out how much money she will have saved when her box is full.

Figure 1



The members also have communication problems and they are planning to construct a telecom mast on top of a hill. The base of this hill is located at a distance of 80 meters from the sacco office. The angle of elevation of the sacco office to the top of the hill is 50° and the angle of elevation of the office to the top of the mast is 60°. The community has set safety measures that the height of the mast should not be more than 50m for stability reasons.

Task;

a) As a mathematics student, help the SACCO chairperson to know the height of the saving box.

b) Also help the member to know the amount of money each member will have saved when the box is full.

c) Determine the height of the hill on which the mast should be established

d) Determine the height of the mast and comment on your result.

END