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S.2 MATHEMATICS

E.O.T.II.EXAMS

Paper 1

2 ³/₄Hrs

MATHEMATICS DEPARTMENT 2025

Uganda Certificate Of Education

END OF TERM II EXAMS

S.2 Mathematics

Paper 1

Time: 2 Hrs: 15mins

INSTRUCTIONS TO CANDIDATES:

This paper consists of two sections: A and B. It has six examination items.

*Section A has **THREE COMPULSORY** items.*

*Section B has two Items, Answer **ONE** item from this section.*

*Answer **FOUR** examination items in all.*

*Any additional item(s) answered will **NOT** be scored.*

All working must be shown clearly

Begin each item on a fresh sheet of paper.

Squared paper are provided.

Silent non programmable calculator may be used.

Turn Over

SECTION A

Answer **all** items in this section.

Item 1

Two friends, Sarah and Moses, started a poultry project to which they contributed money in ratio 4:6 respectively.

They agreed to share the profits in the ratio of their contributions and the project started with 2,000 birds.

After selling all the birds, they made a profit of one million five hundred thousand shillings. They re-invested the profit in the project and the number of birds increased to 2,500. However, Moses and Sarah were not sure of the amount they re-invested as well as the percentage increase in the number of birds.

Task:

- (a) How much of the profit did Moses and Sarah re-invest in the business?
- (b) What was the percentage increase in the number of birds?

Item 2

ASHIM foundation organizes charity fun runs every year. It is observed that the number of runners increases each day by 5 runners and only 20 runners registered on the first day. The foundation intends to save at least Ugsh.1.5millions after the run. It incur certain expenses per day to organize the run, and each runner is to contribute Ugshs.20, 000.

The foundation planning committee wants to predict the number of participants will be registered on 30th days and how much should be spent per day in order to meet the target.

The runners are to start from the starting line at (0, 0) to checkpoint A at (3, 4) and from checkpoint A to finish line at (7, 7), but they are not informed about the displacement from the checkpoint A to finish line.

The committee is to design a rectangular gold medal for fast runner measuring an area of 48cm², whose longest side being 2cm longer than its width.

Task:

You have been selected as the chairperson ASHIM organizing committee;

- (a) Determine;
 - (i) The number of participants will be registered on the 30th day.
 - (ii) How much to be spent per day.
- (b) Determine the displacement from the checkpoint A to finish line.
- (c) Calculate the length and width of the rectangular gold medal

Item 3

Your brother wants to design a children's playground. The playground will have a triangular garden and a circular fence around the garden. The two sides of the triangular garden will measure 50m and 70m, and the angle between them will be 45° .

Your brother also wants to construct a circular fence around the garden such that the circular fence perfectly touches the three vertices of the triangular garden.

Your brother needs help in identifying the type of triangle represented by the triangular garden, coming up with an accurate design of the playground.

Task:

Help your brother to;

- (a) Construct an accurate design of the children's playground.
- (b) Identify the type of triangle represented by the triangular garden and give a reason for your answer.

SECTION B

*This section has **two** items
Answer **one** item from this section.*

Item 4

A curtain wall block has a triangular design ABC with coordinates presented on a square grid white paper at A(1, 2), B(5, 2) and C(2, 5). The designer modified the design by rotating ABC under a certain angle about a certain Centre to form a new design $A^1B^1C^1$ whose coordinates are, $A^1(-2, 1)$, $B^1(-2, 5)$ and $C^1(-5, 2)$.

The triangle ABC is also reflected through the line $y = 0$ to obtain the third triangular design KLM. An engineer wants to know the Centre and angle of rotation that was used in the design and also the position of the third triangular design.

The size of the design KLM is reduced so that it is one-tenth of its original size and the reduced width is recorded as 6.8 units, he wants to know the original width.

Tasks.

- (a) On the same square paper, plot all the three triangular designs, ABC, $A^1B^1C^1$ and KLM.
- (b) Help the engineer determine the centre and angle of rotation that was used in the design
- (c) State the position of the third triangular design KLM
- (d) Help the engineer determine the original width.

Item 5

Tasha bought a circular flower garden UGX.9, 500,000, the garden is surrounded by a plastic edge measuring 132m long. A portion of about 60° has been eaten up by insects, so he is planning to sell the remaining portion at UGX.8, 000 per square metre. He's not sure whether he will make some profits after selling the remaining flower garden.

Task:

As a mathematics student;

- (a) Calculate the area of the flower garden that was eaten up by insects.
- (b) Help Tasha ascertain whether he will make some profits after selling the remaining flower garden. (Take $\pi = \frac{22}{7}$)

END