

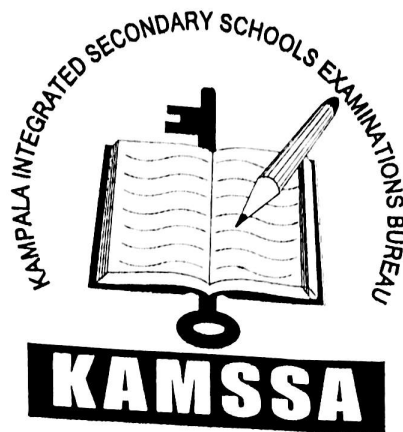
456/1

MATHEMATICS

Paper 1

July - August 2026

2 ¼ hours



KAMSSA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

MATHEMATICS

Paper 1

2 hours 15 minutes

INSTRUCTIONS TO CANDIDATES:

- *This paper consists of two sections; A and B. It has six examination items.*
- *Section A has two compulsory items.*
- *Section B has two parts; I and II. Answer one item from each part.*
- *Answer four examination items in all.*
- *Any additional item(s) answered will not be scored.*
- *All answers 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.*

ITEM 1

The Matugga Community Development Committee has received a land grant to build a modern health center. The total piece of land allocated for this project is $24\frac{3}{4}$ acres. The project structural engineer has allocated 0.54 of the land for medical buildings, a fifth of the remaining land to planting grass and the rest to staff quarters, waiting area and parking area in the ratios: **staff quarters: waiting area = 3:2** and **waiting area: parking area = 1:2**. The hospital director can't understand the engineer's allocation but wants to know the actual area of land allocated to medical buildings.

The hospital director also inquired from the structural engineer about the number of cars that can be parked in the parking area at once and the engineer was not sure, however, he said that one car can occupy an area of up to 0.02 acres of land.

In the community, 2 men can clear half an acre of land in 2 days. The structural engineer wishes to hire men from the community to clear the land for planting grass in only one day but does not know how many men he needs to have this work done.

Task

- (a) As the assistant director of the hospital, use the information provided by the engineer to determine the;
 - (i) actual land in acres for medical buildings
 - (ii) maximum number of cars that can occupy the hospital parking at once.
- (b) As the project coordinator, help the engineer to know the number of men he needs to clear the area for grass planting.

ITEM 2

Kigozi is an innovative young farmer in Luwero district who grows sweet peppers in his green house. He uses two systems that is the Solar system and the Bio gas system in his greenhouse but he realizes that the sum of the maintenance cost of the solar system and twice the cost of the biogas system is Shs 35,000 and also the difference between three times the solar system cost and two times the biogas cost is Shs 5,000. He finds it difficult to determine the daily individual maintenance costs for each system. The peppers he produces are of two categories, pepper x and pepper y where by he wants to know the quantities in every category he can produce in order to maximize profit. He realizes that he can produce at least 20 peppers for x . The number of quantity for pepper x should also not be less than twice the quantity for pepper y . Given that the cost for pepper x and pepper y is Shs 200 and Shs 300 respectively. He wants to ensure that the total cost does not exceed Shs 54,000. He needs to know the quantity of pepper x and y he can produce in order to maximize profit given that the unit profits realized from pepper x and y are Shs 500 and Shs 600 respectively.

Task

- a) Help Mr. Kigozi to determine the daily cost of maintaining one solar system and one biogas system.
- b) (i) Represent Mr. Kigozi's produces as inequalities and equations.
(ii) Help him to determine the possible quantities of the pepper x and y that he should produce in order to maximise profits.

SECTION B

This section has two parts; I and II

Part I

Answer one item from this part

ITEM 3

Company Y produces and sells plastics. To increase their sales, they tried a new method of selling products. This involved hiring sales personals who moved on foot selling products mainly in remote areas.

This method is to be maintained if within the trial period, the average products sold by the hired personals exceeds 45.

The company is to terminate the percentage of personals that sold at most 45 products within the trial period.

Below are the numbers of products sold by different sales personals in the trial month:

55	38	54	58	52	71	40	50	62	23
48	50	42	67	37	51	40	67	65	40
39	59	47	60	26	47	51	46	58	53
45	40	68	69	73	32	46	39	51	59
74	44	51	43	60	48	59	61	36	70

Task

- Summarize the products sold above on a frequency distribution table using a class interval of 10 and starting with the smallest product sold.
- Is the company to maintain the new method of selling products or not? (Justify your answer)
- What percentage of sales personals is to be terminated?

ITEM 4

The class teacher of class X had three students A, B and C that he wanted to select a class monitor from.

He provided the remaining 116 students with papers. They were to tick against whoever they would prefer to be the class monitor.

On collecting and counting the papers, he noticed that 20 had ticked on A and C. 18 had ticked on A and B. 9 had ticked B and C only. Those who ticked on B only were half of those who ticked on A only. 42 had ticked on B. 20 had ticked on C but not the other two. Those who ticked A and C exclusive of B were equal to those who ticked on none of the names.

The teacher needs help to determine the total number of those who ticked on A and C respectively. He is later to compare all the totals of A, B and C to select one who was preferred by the majority to be the class monitor.

It will be easy for the one selected to manage the class well if the percentage of those opposing him is less than 50%

Task

- Help the teacher to determine the total number of those who ticked on A and C respectively and hence help him conclude on who to select as the class monitor.
- Will it be easy for the one selected to manage the class? (Justify your answer)

Part II
Answer one item from this part

ITEM 5

Your uncle wants to make a design in form of intersecting circles in his compound to make it attractive for recreational purposes.

He wishes to have one circle of radius **2.0 m** and another of radius **1.5 m** with the distance between the two intersection points as **1.8 m**.

His plan is to put pavers in the area shared by the two circles since it is to be used as a pathway. Each paver measures **4.0 cm by 8.2 cm** and costs **Shs 250**. Your uncle wants to know the total cost of pavers needed but can't figure it out and this is delaying the process.

Task

Help your uncle to determine the total cost of pavers needed. [Take where necessary $\pi = 3.14$]

ITEM 6

Your uncle makes ice cream cones to ice cream sellers. He makes cones of carrying capacity **32cm^3** and vertical height **4cm**, costing him **Shs50** to make one cone and sells it at **Shs200**. According to him, the selling price of the cone is directly proportional to the capacity of the cone and its cost varies directly as the total material needed to make the ice cream cone.

Recently, he received an order from a new client of making 250 cones, **similar** to the previous cones he has been making, of carrying capacity **256cm^3** each, but he has never made such a cone so he is not certain of how long the diameter of the cone will be and how much material he needs to make such a cone. He also does not know how much money to charge the client for a unit of such a cone.

Task

Help your uncle to determine the;

- (a) Diameter and vertical height of the cone he intends to make.
- (b) Amount of material he needs to make the client's order and the cost he is likely to incur.
- (c) Price to charge his client for each ice cream cone hence find how much profits he will make from this order. [Use $\pi = 3.14$]

END