456/1
MATHEMATICS
Paper 1
2024
$2\frac{1}{4}$ hours

MATIGO EXAMINATIONS BOARD

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 calculations and mathematical tables with a list of formulae may be used

SECTION A

Answer **all** *items in this section.*

Item 1

The new farm manager who started work at Sugar Corporation of Uganda Limited's Lugazi farm on Monday was unable to access the farm store, which held critical records, due to password–protected locks. He reached out to the farm owner, who replied with a message revealing that the password was a two-digit base eleven numeral. The pin had the characteristic that the total of its digits equaled 16, with the first digit being 4 greater than the second.

He gained entry to the store and obtained access to the records, revealing that the farm had a sizable amount of land available for crop cultivation. He intended to allocate 14% of the land for corn, 30% for wheat, and the remainder for soya beans, with a specific focus on planting corn on 42 – acres. Meanwhile, he discovered that his 12 farm workers could cultivate 15 acres every 4 days.

TASK

(a) Educate the new manager on the pin's decimal representation.

(b) Ascertain the farm's total land area and the remaining acres suitable for soybean growth.

(c) Help the farm manager understand how long it will take workers to get the land ready for planting. (20 scores)

Item 2

Your elder sister and brother are tailors and they make jackets and suites for sale each week to look for your school fees. Your sister does all the cutting and your brother does all the sewing. To make a jacket takes 5hours of cutting and 4hours of sewing. To make a suit takes 6hours of cutting and 10 hours of sewing. Neither tailor work for more than 60 hours a week. They make at least 8 jackets each week. The profit on a jacket is Shs 30,000 and on a suit is 100,000.

Task:

(a) Write mathematical statements that show the relation between jackets and suites.

(b) Show the feasible region of the relation on the Cartesian plane.

(c) How much profit can be maximized by your sister and brother in a week? (20 scores)

SECTION B

This Section has two Parts; **I** *and* **II**

Part I

Answer **one** *item from this part*

Item 3

A fast food company plans to introduce fried chicken on the menu and employs a researcher to investigate people's opinion on the weight of this package that will cost Shs 12,000. The researcher decides to conduct a survey on a random sample of people to gather their opinion and use the average weight. The collected data was as below.

Weight(grams)	Number of people
1-10	8
11-20	14
21-30	12
31-40	9
41-50	7

Task:

(a) Giving a reason based on computations using the collected data, suggest the suitable weight of fried chicken to be put on the menu.

(b) The supervisor wishes to know the number of people who prefer a weight greater than 25g. Help him/her to estimate this number of people.

Item 4

A gym is thinking about adding more cardio equipment for its members. The gym manager surveyed a sample of 60 members and asked which equipment they used in the previous month. He considered three types of equipment, treadmills (T), stair masters (S) and dumb bells (D). The manager would therefore come up with a decision to purchase more equipment if the chance of a member who prefers only one equipment exceeds 0.10. 15 members used treadmills, 30 used stair masters, 19 used dumb bells, 8 used tread mills and stair masters, 12 used tread mills and dumb bells, 7 used stair masters and dumb bells while 5 used all the three equipment.

Task:

(a) Determine the number of members that did not use any of the equipment.

(b) Calculate the probability of a member chosen at random used at least one of the three equipment.

(c) Advise the manager with a reason based on calculation, whether to come up with decision on which equipment would be purchased more.

(20 scores)

Part II

Answer **one** *item from this part.*

Item 5

In a bid to reduce malaria infections on Islands, the Ministry of Health supplies mosquito nets to these Islands. A skipper is to distribute mosquito nets to three islands. He normally moves at an average speed of 60km/hr. it takes him 20 minutes to offload the package at each island. The skipper sails from Bubembe Island at 7:00am in the north eastern direction and arrives at Damba Island at 8:30am. Immediately after offloading the skipper sails east of Damba and reaches Koome Island at 9:30am, after another offload, He takes southwest direction to sail to Mageta Island.

Hint: The distance between Koome and Mageta Island is 50km.

Task:

(a) (i) Describe the direction of Mageta from Bubembe.

(ii) At what time did the ship arrive at Mageta?

(b) Describe the direction and distance the skipper should take for a direct route from Mageta to Bubembe. (20 scores)

Item 6

A family decides to paint the inner walls of its living room for New Year celebrations with a budget of Shs 400,000. The room is 5m long, 4m wide and 3m high. The room has two painted doors in the middle of the walls opposite to each other. Each door is 2m high and 0.75m wide. The room has one painted window in one of the side walls which is 1m square. A painter charges Shs 800 per square meter painted and for every 10m square wall painted fully, consumes a 4 litre tin paint which he sells at Shs 70,000.

Task:

As a mathematics student;

(a) Establish computations to find out if the budgeted money could be enough for this work.

(b) If a painter offers a discount of 10% on labour and 5% on every litre of paint. How much money shall the family save? (20 scores)

END

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