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

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 sheets provided.*

Graph paper is provided.

Silent, non-programmable scientific calculators and mathematical tables with a list of formula may be used.

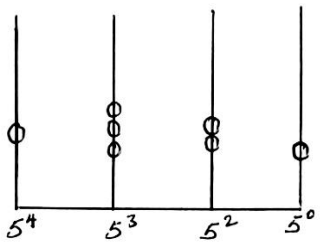
SECTION A

Answer **all** items in this section.

Item 1:

Two twins A and B where presented with an abacus to write the number on it. A wrote one thousand fifty five and the other wrote one thousand fifty one. They need your help to know who amongst them is correct.

The abacus:



Twin A was sent to buy 2kg of sugar. He did not find sugar at the usual shop so he bought it at another shop and was given a balance of Ugx.37, 000 on the Ugx.50, 000 he went with. The mom asked him how much he was charged for each Kg but unfortunately he did not ask the shop attendant.

Both twins have to go to school. They usually pay 60% of the school fees at the beginning and the rest on Visitation day according to school policy. School fees were increased to Ugx.600, 000 and now the parents need to know the school fees they are to pay for both of them at the beginning.

Task:

(a) Who amongst the two twins was correct about the number presented on the abacus?
(b) How much was Twin A charged for a kg of sugar?
(c) How much will the parents pay at the beginning for both twins?

Item 2:

A man wants to construct single rooms and double rooms in his plot of land. He wants both rooms to cover a space that is less than$5000ft^2$. He wants the single rooms to cover a space of at most$3000ft^2$. The space to be covered by single rooms should be greater than the space covered by double rooms since people in area where the plot is located prefer single rooms to double rooms. He is finding it hard to decide on the largest space the two can cover to maximize space.

Task:

(a) Form mathematical inequalities and expressions describing his situation.

(b) Suggest to him the largest space both rooms can cover to meet his conditions and maximize space.

SECTION B

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

Part I

Answer **one** item from this part

Item 3:

Your guardian operates a catering company. He gave you a list of major ingredients he will need to cook beans and beef at the two occasions he was called at such that you help him account for how much he will need in total for both.

OCCASION ONE:

BEEF: 1bucket of tomatoes, 2bunches of onions and 2liters of cooking oil.

BEANS: $\frac{1}{2}$ bucket of tomatoes, 1bunch of onions, and 1liter of cooking oil.

OCCASION TWO:

BEANS: $\frac{1}{2}$ bucket of tomatoes, I bunch of onions, and 1litre of cooking oil

BEEF: $1\frac{1}{2}$ bucket of tomatoes, 3 bunches of onions and 2litres of cooking oil.

UNIT PRICES:

A bucket of tomatoes is$Ugx.10{,}000$, a bunch of onions $Ugx.5{,}000$ and a liter of cooking oil at $Ugx.7{,}000$.

Task:

(a) What are the total quantities of each ingredient that your guardian will need for both meat and beef respectively for the two occasions?

(b) How much money will he need for both beef and beans respectively for the two occasions.

(c) (i) If the total amount on the budget for both occasions is $Ugx.4{,}000{,}000$, what percentage of that amount will go on ingredients?

(ii) According to the percentage, should he cut the budget for ingredients or not? Justify your answer.

Item 4

Your friend wants to sell dresses in your home area according to age. She requests you to recommend the age range that she can sell.

You wish to recommend an age range **with the modal age being the highest**.
Below is the summery of data you gathered:

Age groups (years)	30 – 34	35– 39	40 – 44	45 – 49	50 – 54	55 – 59
Number of people.	6	3	13	7	4	3

Task:

(a) Which age range will you recommend according to your data?

(b) What is the probability that your friend will succeed if she accepts your recommendation?

(c) According to the probability, is your recommendation a good choice? (Justify your answer.

Part II

Answer **one** item from this part

Item 5:

One of your friends wants to create a house with a prism rooftop for the mathematics project. He wants to account for the size of ply wood plus the amount he will need to buy it using his measurements below:

HOUSE BASE:

- 2side walls will measure 45cm by 20cm.
- 2front and back walls will measure 17cm by 20cm.

ROOF:

- 2 isosceles triangular faces will have a base of 45cm and a height of 18cm.
- The rectangular faces will have a length of 17cm and a width equivalent to the slanting edges of the triangular faces.

He also wants the ridge of his roof to be at the Center of the two rectangular faces. He wants determine the angle at which he will meet the two faces to achieve that.

Note:

$1\ ft^2\ of\ ply\ wood = Ugx.1000$

$1ft = 30.5cm$

Task:

a) What is the size of ply wood that he will need and how much will he need to buy it?
b) At what angle will he meet the rectangular faces of the roof to achieve what he wants?

Item 6:

Mary usually sets off from a landing site that is located on coordinate O (-9, 7) on the grid map to island A which is located at coordinate A (-6, 3) during her day off. Island A is south east of landing site O. This time she plans to extend her tour from island A to another island B that is 9km north east of island A and then sail back to the landing site through the direct route.

She plans to tour around island A for 3hours and around island B for 4 hours. Her journey is to start at 10:00am. She hopes to be back by 20:00hours since she has work the following day. She wants to know if it's possible to return by that time. The boat is usually ridden at an average speed of 64km/hr.

She is in charge of paying her fellow workers. Some workers were given a salary increment to UGX.650, 000. This includes allowances of UGX.120, 000. She needs to know how much income tax she is to deduct from them and the net amount she is to pay them using the tax bands below:

TAXABLE INCOME (UGX)	**TAX RATES (%)**
0 – 200, 000	0
200, 001 – 400, 000	10
400, 001 – 600, 000	15

Task:

(a) (i) What is the total distance they are to sail?

(ii) What is the total time the entire tour will take inclusive of the time the boat will take to sail the whole journey?

(iii) Will she make it back at the planned time? (Justify your answer)

(b) How much will she pay her fellow workers?

END