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MATHEMATICS
Paper 1
Jul/Aug 2024
2¼ Hours

JINJA JOINT EXAMINATIONS BOARD

Uganda Certificate of Lower Secondary Education

MOCK EXAMINATIONS - JULY / AUGUST 2024

MATHEMATICS

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** *(4) 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 will be provided
Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used.

SECTION: A

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

Item 1

A businessman loaded his truck as follows; 324 boxes of cooking oil, 108 cartons of salt, 115 bags of 25kg of sugar each and cartons of big Aquasipi water bottles equivalent to a third the number of cartons of salt heading to Katakwi using Tororo-Mbale road. On reaching Manafa bridge, he realized that the flood weakened the bridge and heavy vehicles were not allowed to cross. He organized another truck at the other side of the bridge through a friend. He has to use people to transfer all his goods across the bridge on foot. He needs groups of people to carry these goods to the other truck across. He prefers that each group handles one type of goods and all members of a particular group carry equal quantities across.

On arrival to Katakwi, he sold 5 cartons of salt at 100,000/-to one of his retail shop customers and this retail shop customer started selling 3sackets of salt at 2850/- and was able to sell the 5 cartons he bought before he closed his shop on that day. Each carton of salt has 24 Sackets of salt.

To ensure proper bridge renovation, the constructors will use a ratio of 1:2:3 of cement, sand and aggregates respectively. There were already enough 18,000 tons of sand at the site, the required aggregates are to be donated by Moroto Rock company since they use that route so often. It has been noted that the businessman in question takes goods to Katakwi after every 3months and his friend takes goods to Katakwi after every 5months. They last met in Katakwi in January, 2024 and they agreed to have a discussion about their saving scheme the next time they will meet in Katakwi.

Task:

(a) Help this businessman to determine the possible number(s) of groups of energetic youths and what each group will carry.

(b) Determine with a reason whether the retail shop seller benefited at the end of the day or not?

(c) The district engineer is on leave and you have been requested to send to Moroto Rock company the details of the needed tons of aggregates. Show the details of the aggregates you will send to Moroto Rock company.

(d) In which month will they meet again to have a discussion about their saving scheme?

Item 2

Your family doesn't have enough money to organise a big graduation party for your elder brother Paul after graduating as a civil engineer. Paul suggests that they can use Fare hotel near the university where they will invite a few family members and friends to a simple graduation party. A plate of food for an adult is at 20,000/- and for a child is at 10,000/-. The space agreed upon is for 50 people. The family has 900,000/- to cater for the food at this hotel.

The chairman organising committee doesn't know whether to register 40 adults with 10 children or to register 35 adults and 15 children. It was noted that some family members and friends missed

space at Fare hotel and were identified as follows; at least 12 adults (family members & friends) and that the family members (x) were at least three times the number of friends(y).

They decided to solicit some money to cater for those that missed space at Fare hotel and the contributions made amounted to 130,000/= and those who had missed were taken to a nearby restaurant. Every family member was given food at 10,000/= . Every friend was given food at 15,000/=.

Task:

a) Help the chairperson to make a decision on the number of adults and children to register in order to use all the planned money.

b) Using a graph, establish whether the money solicited will be enough to clear the bills at the restaurant.

SECTION: B

PART 1

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

Item 3

36 Farmers of Mwero Zone A formed an association and in the recent harvest they got the following weights of produce (in kg).

240	250	360	400	240	160	250	320	210	330	350	380
270	290	390	300	340	150	240	310	200	230	290	280
170	240	340	310	180	150	250	280	290	280	250	360

All farmers agreed to bring together all their produce so that they can share equally in order to support those who got low produce to remain in the production. It is assumed that every farmer will receive 270kg after sharing equally.

The ministry of agriculture, animals and fisheries would like to identify not more than ten farmers whom they can support with some farm inputs from those whose weights didn't exceed 210.5kg using their more sensitive automatized weighing scale.

The fertilizer factory in Tororo is going to facilitate farmers who got above 310kg of produce to go and visit their factory so as to educate them about effective use of artificial fertilizers.

Task:

a) Use your expertise and organize the above information so that it is well understood and suggest whether the assumption was right.

b) With the help of a statistical illustration, determine whether the support was to be given or not and if it was given how many got?

c) What is the chance that a member of the association is going to visit the fertilizer factory in Tororo?

Item 4

In the village of 80 active farmers, 36 farmers grow groundnuts, 43 farmers grow cassava, 30 farmers grow rice, 19 farmers grow both groundnuts and cassava, 16 farmers grow groundnuts and rice, 4 farmers grow cassava and rice only, while the other active farmers are only coffee growers and they are equal to those who grow groundnuts and cassava only.

Since the coffee farmers are still few, the government has decided to boost them with more coffee seedlings to enable increased production. Seedlings are sent to a meeting where all the active farmers are gathered.

The Local government also plans to give every Groundnut farmer 100,000/=, every cassava farmer 50,000/= and every rice farmer 150,000/=.

Task:

a) Find the chance that a farmer received seedlings.

b) With your knowledge in matrices, help the local government treasurer to determine the total amount needed for all the farmers.

PART II

Answer one item from this part

Item 5

Maria left Kampala for Arua at 7:00 am in a gateway bus which used 1 hour to reach Luwero. From Luwero it used $2\frac{1}{2}$ hours to reach Kafu bridge. The bus then left for Karuma bridge and reached after 1hour. Later the bus continued to Pakwach a distance of 120km from Karuma bridge. It then spent 2 hours moving to Arua and Maria was happy to reach her destination. It was clear that the bus was moving at 60km/hr because of bad weather and was staying at some stop overs (Luwero, Karuma bridge and Pakwach) for half an hour and an hour at Kafu bridge.On reaching her aunt's place where she was to stay for a long holiday the aunt was disappointed that she delayed to arrive and yet by 7:00am she had left her father's home for Arua, she doubted Maria's movement. Maria thinks that if an illustration is shown to her aunt, she will believe her explanation.

Gateway bus company has started giving out a free mineral water bottle of 500ml to any passenger who doesn't get him/herself a drink or anything to eat from the major Kafu Shopping Centre. The management of the bus buys its water in cartons. On this day it gave out 27 bottles from a stock of 4 cartons. Also all the five staff working on the bus for that journey receives 3 bottle each for the journey. Every carton has 12 bottles of 500ml. Every day the company ensures that they have bottles equivalent to 4 cartons.

Task:

a) Prepare an illustration for the whole journey so that Maria can use it to explain to her aunt.

b) Help the bus conductor to determine the number of cartons needed for the next day.

Item 6

Opio and Odong are twins. They used their first salary to buy their first piece land with corner stones A_1 (0,0) A_2 (10,0) A_3 (10,40) A_4(0, 40) and these corner stones were named in meters. They have been using this land together. Upon getting engaged to marry, they want to separate their families. They decided to acquire another piece of land of the same size in the same location from the other side of the road. There are two roads passing through (20,50) and they are parallel to this piece of land. Two pieces of land on the other two sides of the roads have been offered for sale from which they are to choose one. The same size of the road reserve (space between the piece of land and the road) is left on either sides of the road.

The local government of the area requires that every after five years of acquisition of the land one has to increase or reduce the piece of land as an indication of development and unity. To increase land, one can acquire it from a neighbour making the neighbour to reduce his/her piece out of agreement and at a cost.

The one who remained on the original piece of land wishes to construct a house on half of this piece of land before the end of this year. The number of bricks needed for the whole house depends on the area of the space available for the house construction.

Task:

a) Using cornerstones, display the pieces of land from which these twins can choose.
b) Display how the first piece of land will look like if the owner doubles it in reference to cornerstone A_1 without entering the road reserve while keeping the same shape of the land.
c) They have got the supplier of bricks and they would like to determine the number of bricks. Help them establish the area of the space available for the house which will help them estimate the number of bricks for the house.

End