

456/1
MATHEMATICS
Paper 1
July 2024
2 ¼ Hours



ELITE EXAMINATION BUREAU MOCK 2024

Uganda Certificate of Education

456/1

MATHEMATICS

2 hours and 15 minutes

INSTRUCTIONS TO CANDIDATES:

- ✓ This paper consists of **two** sections; **A** and **B**. It has six 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 calculators and mathematical tables with a list of formulae may be used.

SECTION A

Answer all items in this section

Item 1.

A newly recruited school secretary was given an assignment to type the results for co-curricular activities of three houses. On turning on the computer, it required a login password unfortunately the head teacher is not around to tell her the password but there is a paper written on encrypted password as 112_{five} . The actual password is a four-digit number in a number base less than five.

The table below shows the summary of the scores.

House	Debate	MDD	Athletics	Total Score
Lumumba	40%	18 points	0.181818...	
Abiola	19 points	24 points		
Mandela		9 points	$\frac{6}{11}$	
TOTAL	60	51	55	

It was agreed by the house teachers that the winning house receives $1\frac{1}{2}$ times that of the second house, the third house receives a half of the second house.

A few days after reporting, a technician serviced the equipment she uses in her office. She later realized that the computer is serviced after a fortnight, the printer after 18 days and communication device after 21 days.

Task

- Help the secretary to determine the actual password digits
- Help the games and sports master share the money amongst the participating houses if the amount provided is UGX 1,800,000.
- After how many days will the three equipment be serviced together again?

Item 2.

Your friend makes juice and she has got an order for making juice for a wedding party. The client wants only two types of juices: Mango juice and Beetroot juice. She is to pack the juice in 20-liter jerry cans. She must make at least 35 jerry cans of mango juice and the number of beetroot juice jerry cans should be more than 15 but not exceeding 20 jerry cans. The transport means available can only carry up to 60 jerry cans. She has accepted to sell each jerry can of mango juice at 100,000/= and that of beetroot juice at 140,000/= but she does not know the number of jerry cans for each type of juice to make given the constraints.

- a) i) Write the mathematical statements that show the relation between the number of jerry cans of mango and beetroot juice.
 (ii) Show the feasible region of the relation on the Cartesian plane.
- b) Help your friend to determine the maximum amount of money she will be able to make from the sale of mango and beetroot juice.

SECTION B

This section has two Parts; I and II

Part I

Answer one item from this part.

Item 3.

There has been a shortage of books for the new lower secondary curriculum in schools. At the beginning of the year, the district education department received letters from four different schools in a given sub county requesting mathematics books for learners in S.4. The requests were as below;

The first school requested for 24 books of type A, 36 of type B and 45 books of type C

The second school requested 90 books of type B and 48 books of type C.

The third school requested 25 books of type A and 150 books of type B.

The fourth school requested 20 books of type A, 30 books of type B and 60 books of type C.

The cost of one book of type A, B and C is Shs.23,000, Shs.28,000 and Shs.26,000 respectively.

On Monday 19, February 2024, the inspector of schools visited the first and second schools and found out that the books were received as requested. He spent a quarter of the time at the first school and three-eighth of the remaining time in the second school.

His inspection plan showed that in 24,480 minutes after Monday, he went to the fourth school. Inspection of schools starts at 9:00 am to 1700 hours.

Task:

- a) Help the District Education Officer determine the amount of money required to buy all the books requested.
- b) Determine the time at which the inspector reached the second school if he left there 25 minutes to the end of supervision time.
- c) On which day did the inspector go to the fourth school.

Item 4.

Your brother has just graduated from the university and he has organized a party at home. He invited guests for the party but some few came for the party vigil and needs to serve them with evening tea. You have been sent to pick two cups from the cupboard but unfortunately the power goes off before picking the cups. You now decide to pick them

one after the other from the cupboard randomly. There are five white cups, four red and six blue cups in the cupboard.

In the afternoon during the party, there are fifty guests and he provided them with Rice, Matooke and Kaalo for lunch. Twenty guests were served with Rice, twenty six with Matooke and twenty were served with Kaa o. Eleven guests were served with both Rice and Matooke, eight were served with both Matooke and Kaalo and six were served with both Rice and Kaalo. Six of the guests requested to be served with only a drink.

Task:

Determine the;

- (a) Probability that the cups picked were of the same color.
- (b) Number of guests who ate only one food
- (c) Probability that a guest picked at random was served only one food.

Part II

Answer one item from this part.

Item 5.

The LC five chairperson of your district is organizing a thanks giving function at the sub-county headquarters. He has just realized that he needs one hundred hand washing tanks of different sizes to be distributed to schools, hospitals and other public places; and visits your neighbor's hardware. Unfortunately, the tanks are out of stock and an order has to be placed in Durban South Africa and the tanks have to be transported by an air cargo. From Durban it flew west at a speed of **280km/hr** for $\frac{3}{4}$ hours before reaching Airport B. It then altered its course and flew North-west to Airport C at **220km/hr**. From there it flew on a bearing of 060° to Entebbe at **240km/hr** for $1\frac{1}{2}$ hours. The total time of flight between the four places was $4\frac{1}{2}$ hours.

The tanks have two sizes, a smaller tank with a base radius of 40cm and a larger tank with a base radius of 60cm. the capacity of the small tank is 120 liters.

As a token of give back for the community, he decided to give out houses valued at UGX 5million. He asked everyone who wanted the houses to make a down payment of UGX 1.5 million and balance be taken as a loan at a compound interest of 5% per annum from the village SACCO. The loan was to be repaid over a period of 10 years.

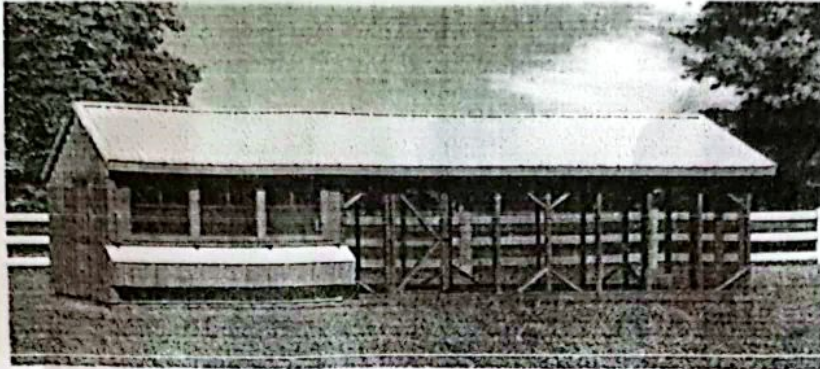
Task

- (a) If the air cargo flew directly back to Durban at a speed of **200km/hr**, determine, how long it took to fly back to Durbar .
- (b) Find the capacity of the larger tank.
- (c) Find the cost of the house.

Item 6.

A poultry farmer in your village has a rectangular poultry house of 6m x 3m and has noticed vices in his poultry house. He has been told that one of the causes is overcrowding. He now wants to construct a similar house with an area four times bigger than the current house. The new house is to have two slanting roofing sections which

meet at an angle of 65° . He is to cover each of the surfaces with transparent plastic sheets, each has a usable area of $22,390\text{cm}^2$ and costs Shs.32,000. He wants to get a loan from the village SACCO at a compound interest rate of 22% per annum to buy the required plastic sheets which he expects to pay back after 2 years. Additionally, he wants to order 50 broiler chicks and 70 layer chicks, but he is told by the supplier that it will cost him shs.325,000. On checking his records, he found that last month, he bought 30 broilers and 25 layer chicks at Shs.152,500 from the same supplier.



Task.

- (a) (i) Help the farmer to estimate the amount of money to be borrowed for buying the iron sheets.
- (b) (ii) How much will be the total cost of roofing?
Help him determine the price of each broiler chick and layer chick if the prices remained the same.

END