

Students Name:

School Name..... Index Number

MATHEMATICS
PAPER 1
JULY/AUGUST 2025
 $2\frac{1}{4}$ HOURS



HES MOCK EXAMINATIONS 2025

UGANDA CERTIFICATE OF EDUCATION

MATHEMATICS

PAPER 1

$2\frac{1}{4}$ HOURS

INSTRUCTIONS

- This paper has two sections, A and B. it consists of 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 addition 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.

SECTION A

ITEM 1

Your twin brother who works abroad sent five millions four hundred and sixty thousands shillings only for his two children. 60% is to be used for son's fees and half of the remainder on the daughter's fees, 392,000 shillings for transport and medical care. The rest given to the children for their shopping. He has asked you for help on how to allocate the money as instructed but he decided that he would give the children their total amount for them for shopping. The girl asked her brother that they should play a game where the winner will get 4 parts while the loser gets 3 parts of the money. The girl has her card with number 5 and asks her brother to randomly pick a card out of the five cards each with octal base and he is required to convert the number on his card to decimal base.

If his number turns out to be greater than that of his sister then he wins. The boy picks a card with number 15.

TASK

- As a student of mathematics club, help your twin brother to allocate the amount sent as instructed
- Who of the children will get the most amount and how much will it be

ITEM 2

A great farmer has a poultry farm where by he keeps chicken and goats. On a certain day, the manager informed him that the total number of heads for both chicken and goats are 400 heads and their two legs are 960 legs. He was also encouraged by his friends on how to utilize the available space which was underutilized. He decided to plant Irish potatoes and tomatoes at the same time. He is to plant at most 3 bags of Irish potatoes. He has been told that the total number of boxes of seedlings for both Irish potatoes and tomatoes must not be less than 6 because of the space available. The number of boxes of tomatoes must be less than 6. Each box of Irish potatoes yields ugx300, 000 while each box of tomatoes yields ugx500, 000 per season. He wants to obtain maximum yields.

TASK

- Determine the total number of chicken and goats at the farm
- Express the conditions for planting Irish potatoes and tomatoes as inequalities
 - Show the feasible region of the condition on the Cartesian plane.
- Determine the number of boxes of Irish potatoes and tomatoes the farmer should plant in order to obtain maximum yield.

SECTION B

ATTEMPT ONLY ONE ITEM

ITEM 3

Amos was asked by his biology teacher to assist him with his two biology books. He randomly picked from his bag one at a time without replacement. He had 3 biology books and 5 chemistry books and gave them to the teacher without checking, the teacher moved back to the staffroom. Amos also wishes to do biology, chemistry and mathematics at his A level or one of them. If according to the teachers recommendations, the chance that he can do atleast two of them. If greater than 0.5, he will do all of them and if it is less, he will choose only one that is mostly recommended. He got recommendation from 36 teachers. 12 recommended biology, 15 recommended maths and 19 recommended chemistry. 3 teachers recommended biology and mathematics, 5 recommended maths and chemistry, 4 recommended biology and chemistry and some recommended all the three subjects.

TASK

- Determine the probability that Amos gave his teacher a combination of books different from what his teacher asked for.
- Will Amos do all the three subjects or choose only one? (justify your answer)

ITEM 4

The ministry of health through Kayunga referral hospital has embraced on the efforts of reducing TB the director of the hospital has tasked the laboratory technical to provide information on the ages of all patients who test positive to TB. The table below shows the ages of the patients that visited the hospital in May 2024.

54	64	56	14	70	84	66	27	51	43
38	92	17	54	18	73	70	45	62	33
27	35	24	44	43	24	72	40	36	51
55	87	62	27	58	61	37	42	41	65
24	56	57	56	47	72	75	69	59	37

Doctors noted that $\frac{3}{5}$ of the patients recovered from TB

TASK

Help the doctor to determine the;

- Average age of the patients that visited the hospital in the month of May 2024
- The age of patients who are likely to recover from TB

ITEM 5

A student from a university in USA is planning to come to Uganda for research, he wants to go to Arua and Mbale districts, he has USA dollars 9400 that he will use during his stay and will be required to exchange it for Uganda shillings at an exchange rate of 1 dollar for ugx 3700. He contacts a company that can fly him to her destinations on arrival, the company informs her that they will fly from Entebbe to Arua a distance of 450km N60°E direction. Then from Arua to Mbale at a speed of 1200Km/hr for 30 minutes on the bearing of 175°. After reaching Mbale, they encourage him to report back to Entebbe using a direct route because of the poor conditions with in Mbale town. Given that the plane company charges ugx30,000 for every kilometer of distance covered.

TASK

- Determine her total amount on Uganda shillings after the exchange.
- Will the amount be enough for her to travel from Entebbe and back? (justify your answer)

ITEM 6

A laboratory doctor wants to magnify a blood test sample on a square glass block whose corners on a 1 square = 1 cm grid are defined by P(4,2), Q(6,2), S(6,4) and T(4,4) in such a way that its new size is defined by P¹(8,6) Q¹(14,6) S¹(14,12), T¹(8,12). He needs your advice on the scale factor he can set in the magnifier plus the position where he can place it from the glass block to achieve that. The doctor also wants to achieve that. The doctor also wants to buy a certain laboratory machine at hire purchase. On contacting the vendor, he sent the following detail;

Read the advert below;

LABORATORY MACHINE, LABORATORY MACHINE

Terms

- Cash: 55 million (discount 15%)
- Hire purchase: deposit 60% of market price and pay 6 monthly installment at ugx5,000,000 per month.

The vendor advised the doctors to gather money and use cash terms rather than the purchase.

TASK

- Advise the doctor on the scale factor he can set in the magnifier and position on the grid he can put it to achieve what he wants.
- Do you advise the doctor to take the vendor's advice?(justify your answer)

END