

Candidates' Name:

Signature:

Random No.					Personal No.		

(Do not write your school / Center name or Number anywhere on this booklet)

456/1

MATHEMATICS

Paper 1

July / Aug 2024

2 ½ HOURS



KAMTEC EXAMINATIONS BOARD

Uganda Certificate of Education

MATHEMATICS

Paper 1

TIME: 2 hours 30 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 calculators and mathematical tables with a list of formulae may be used.

FOR EXAMINER'S USE ONLY			
SECTION	ITEM	SCORE(S)	EXAMINER'S SIGNATURE
A	1		
	2		
	3		
B	4		
	5		
	6		
TOTAL			

SECTION A

*Answer **all** the items in this section in the spaces provided.*

Item 1

Tom wants to make a gift box in shape of a cube with a capacity of $27,000\text{cm}^3$ to pack his friend's graduation gift. He needs to know the dimensions of the faces he is to cut out of a cardboard he plans to use to achieve he wants.

He was also called for the job interview in place Y that is 120km away from his home. He was wondering what time he will possibly reach there if he sets off from home at 09:00am given the fact that he usually travels 100km in 2hours. He also wishes to start a business with a friend. According to their budget, they need ugx.3, 000,000. Tom says he can contribute ugx.1, 000,000 and the friend is to contribute $1\frac{1}{2}$ of John's amount. They need to know if their contributions will be enough to cover the budget and if not, they acquire a loan to supplement their contributions.

Task

- a) Help Tom determine the dimensions of the faces he will cut out of the cardboard.
- b) What time will Tom possibly reach the interview?
- c) Will they need to acquire a loan or not? Justify your answer.

Item 2

At an exhibition that is going to last for 2days, Tom has a target of making total sales of ugx.1, 750,000 on day one by selling 100vests and 50shirts. And on day two, his target is to make total sales of ugx.3, 000,000 by selling 150vests and 100shirts. He needs to know how much price he should sell each vest and shirt to achieve targets.

Tom is finding it hard to decide on how many workers he can hire to work on a stall of vests and t-shirts respectively to minimize costs. According to his budget, he can hire not more than 6 helpers for both stalls. He wants a stall for vests to have more helpers than that of t-shirts since he expects more customers for vests than t-shirts.

He wishes to pay each worker on the vest stall Ugx. 60,000 and each worker on the t-shirt stall Ugx.50, 000 for the two days.

Task

- a) How much will he need to sell each vest and t-shirt to achieve his sells targets?
- b) Help him decide on the number of workers he can possibly hire for each stall to minimize costs.

SECTION B

(attempt any one item from each part)

PART I

(Attempt any one items from this part)

Item 3

A certain organization realized that the major causes of school dropouts in a certain community are pregnancy, bullying by friends and teachers, and lack of school fees. They want to create a magazine on each cause showing how it can be solved.

To select which reason they can start with, they gathered data from a sample of 150 dropouts in the community and below where the findings;

40 drop out due to lack of school fees only, 15 drop out due to bullying only, 30 drop out due to pregnancy only, 22 drop out due to lack of school fees and bullying, 32 drop out due to pregnancy and bullying, 30 drop out due to lack of school fees and pregnancy, 11 drop out due to neither of the reasons and some dropout due to all the three reasons.

Task

- a) (i) Which two reasons have equal chances of being selected?
- (ii) What is the probability that school dropouts will reduce if any of the two reasons is selected?

Item 4

An organization wants to start a foundation in a certain community aimed at skilling school drop outs from different levels of education. To limit the number of entrants, they want to put an age limit on the application forms.

Some members in the organization, proposed an age limit that is possessed by 80% of the population and below. Some proposed an age limit of the average age and below. This made them gather data on the ages of a sample of 40 school dropouts in the community to help them make a decision. Below where their findings:

10	16	12	22	26	16	31	15	17	13
13	22	21	23	28	18	17	20	21	11
16	15	14	30	20	13	12	24	27	18
20	25	19	27	19	22	32	28	29	18

Task

- What age limit are both of them suggesting?
- Which of the two would you recommend and why?

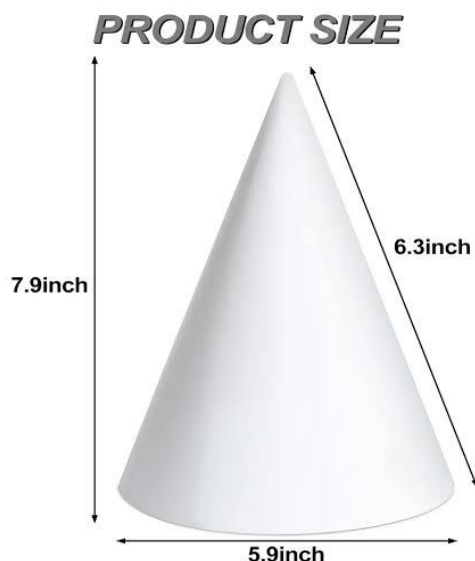
SECTION B**PART I**

*Answer only **one** item from this part. Answers should be written in the answer booklet(s) provided.*

Item 5

A man was invited at a certain party to speak as a guest of honor. The party is to start at 4:00pm however he has to work first until 15:15 hours. To reach the party, he is to drive from his work place **X** marked at (4, 2) on the grid map that is in km, to place **Y** that is North East of **X** and marked at (12, 8). He will then turn northwest from **Y** and drive 32km to the venue of the party. He wants to know at which speed he can drive at to reach the venue in time.

At his work place, he makes conical hats used on birthday parties. On his way to the party, he received a message from a customer requesting for 50 hats that are of the dimensions below:



He is to put wrapping papers on the curved surface of the hats so he needs to know how many full wrapping papers will be bought for all the hats if one wall paper is $61\text{ cm} \times 84\text{ cm}$. (1inch = 2.54cm)

Task

- At what speed will he drive at to reach at the required time?
- How many wallpapers will he need for the order?

Item 6

Mark owns a workshop that makes pet houses. He was instructed to make a dog house. To reduce on cost, the customer gave him a board which is 2500mm and 400mm and the following details about how the house will have to be:

- The base should be a square of 8100 cm^2
- It should be of a height of 60cm.
- It should be in a shape of a pyramid.

Mark needs to come up with a sketch he will follow while making the house with clear dimensions of the base and the triangular faces. And he also needs to know if the board provided will be enough for the entire house and if not, he asks for more.

(1cm = 10mm)

Mark also plans to expand his workshop by acquiring a loan of ugx.2, 500,000 from the bank at a simple interest rate of 10% payable in two years. However, before he takes the loan, he needs to know if he will be able to it back given the fact that he earns average profits of 40% per year and incurs average total costs of ugx.4, 000,000 per year.

Task

- a) Help mark to come up with a sketch showing clear dimensions and to determine if the board will be enough. (give answers to one decimal place)
- b) Should he take out the loan from the bank or not? (Justify your answer)

END