# SENIOR FOUR INTERNAL MOCKS 2024
## MATHEMATICS
## Paper 1
## TIME: 2HRS 15MINS

*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.*

## SECTION A
*Answer* **all** *items in this section*

**ITEM 1:**

Your friend has visited you with the concern that she wants to who start a business worth UGX.10, 000,000. She has a quarter of the money and wishes to borrow the rest from the bank. He visited a certain bank and it's willing to give her the loan payable in three years at a compound interest rate of 20%.

According to her estimations, she expects to incur a total cost of UGX.5, 000,000 per year and also expects to make profits that are 10% more than the cost. However, what she is not sure of is whether those profits will be enough to pay back the loan in the required time. And so she is requesting you to help her find out.

She has also brought you 30 dresses and 6 pairs of shoes to share them equally with your other friends.

**TASK:**

a) (i) How much will your friend get from the bank?

(ii) Will your friend be able to pay back the loan in the required time?

b) What is the highest number of friends you will share your clothes with?

**ITEM 2:**

A certain restaurant shows premier league games every weekend. The manager of the restaurant is to organize seats for the viewers. The seats available are in two classes, executive and ordinary. The ticket for an executive seat is shs15,000 and that for an ordinary seat is shs 10,000.

The following constraints are subjected to the number of executive and ordinary seats the manager arranged on one of the weekends;

$$y \geq -2x + 4, \quad 3y > 4x + 6 \text{ and } y \leq 10$$

**Task**

(a) As a mathematics student, help the manager to know the number of executive seats and ordinary seats he should arrange in order to maximize the collections on that day.

(b) One of the walls of the restaurant is designed with small tiles in 30rows, and each tile costs shs 2500.The first row has 20 tiles and each next row has 3 more tiles than the previous row. Find the total cost of all the tiles on the wall,

## SECTION B

*This Section has two Parts;* **I** *and* **II**

### Part I

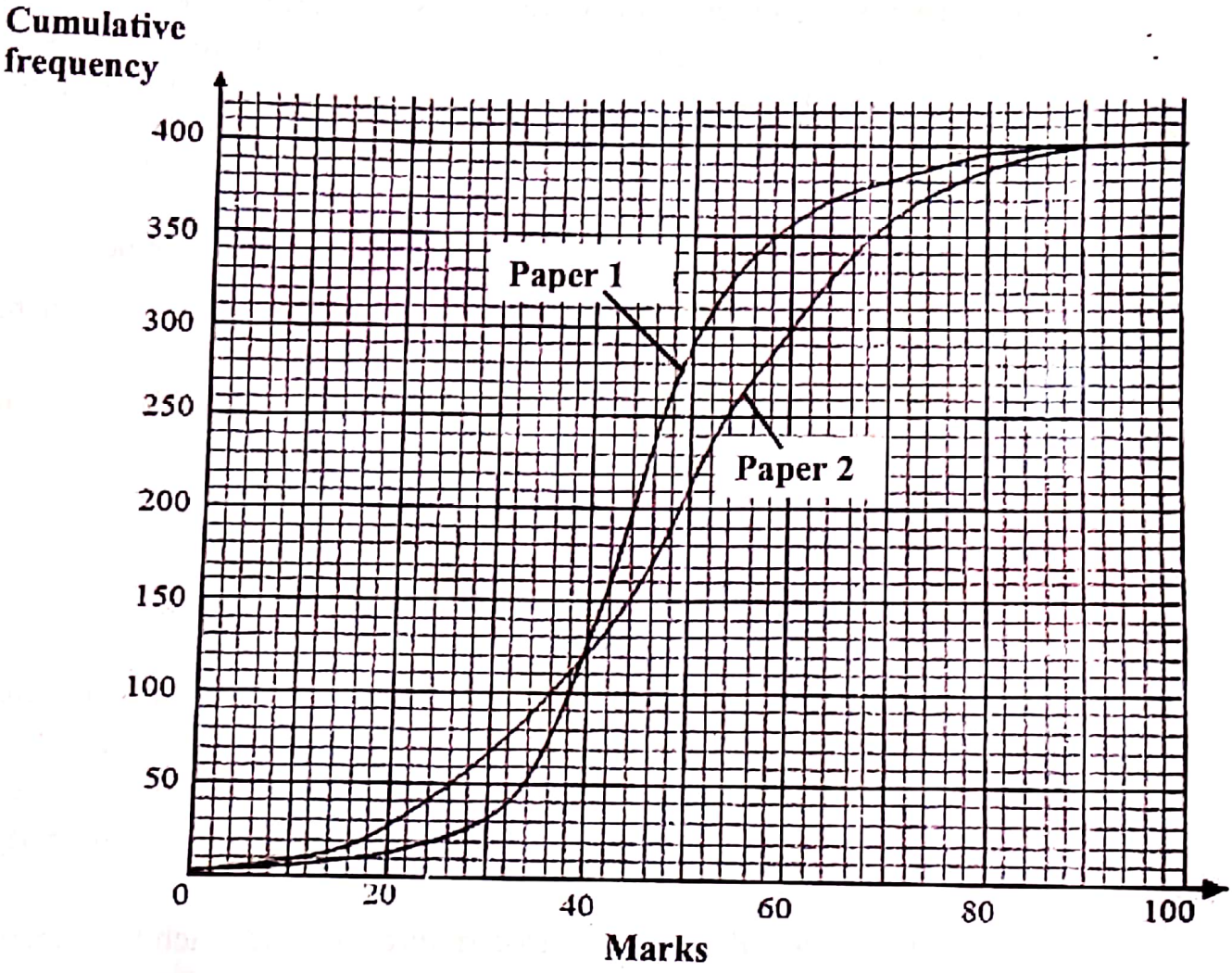
*Answer* **one** *item from this part*

**ITEM 3**

The head teacher of a certain school held an abrupt meeting with the different heads of departments. The head of maths department and all maths teachers had gone for a workshop. The head teacher had wanted to know the performance of 400 senior 5 students in mathematics paper one and paper two but unfortunately no one was available to give the information. He wanted to know;

- The percentage of students who scored less than 44 marks in each of the papers.
- Amount to give as an award to the maths department for the distinctions they got if a distinction mark in this school is at 70 marks or more. Every distinction in paper 1 is given shs 9,600 and every distinction in paper two shs 10,500.
- The number of students who would be in a new stream to be created. This stream will have all students whose marks in paper 2 were between 20 marks and 50marks.

When the headteacher checked the departmental file, the head of maths department had summarized the performance of the two papers on the graph below.




**Task**

(a) Help the head teacher to know the

(i) percentage of students who scored less than 44 marks in each of the papers.

(ii) amount to award to the maths department for the distinctions.

(iii) number of students to be in the new stream.

(b) During the meeting it was noted that of the 14 people in attendance, 8 did Arts at A level and 9 did sciences. There were no participants who had never done Arts or Sciences.

Determine the number of people who attended the meeting and had done only arts.

**ITEM 4**

Peter and Sam live in Kampala. They decided to go for a tour to Mbale which is 290km away. They started their journey from the same place at the same time. Peter was driving at a constant speed 50kmh$^{-1}$. Sam is not used to the road so he decided to drive his car at a speed of 40kmh$^{-1}$ in the first hour and increased the speed by 10kmh$^{-1}$ in each hour that followed until he reached Mbale.

**Task.** As a mathematician, using knowledge of graphs, determine;

(i) whether Sam's car be able to overtake Peters car before reaching Mbale. If it does at what distance from Mbale will it happen.

(ii) who of the two, Peter or Sam arrived earlier to Mbale and by how much time in minutes did one have to wait for the other.

## Part II

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

**ITEM 5**

Your uncle has offered to drive you to your friend's birthday party. He normally drives his car at an average speed of 50 kmh$^{-1}$, so he requests you to get directions to the party reception and the time you are supposed to be there so that you decide on when you can leave home to reach on time. You were informed that the party will start at 2:00 Pm and the directions are:

- From your home, take the north eastern direction and reach the supermarket that is 20 km away.
- Then take the road that is south of the supermarket and it will take you 45 minutes to reach the junction.
- From the junction, take the southwestern road and drive 25 km to reach the party reception.

On reaching the party reception using the given directions, your friend remembers that there is a direct route from your home to the reception that you could have used but does not know how long it is.

**Task:**

(a) (i) Describe the direction of your home from the party reception.

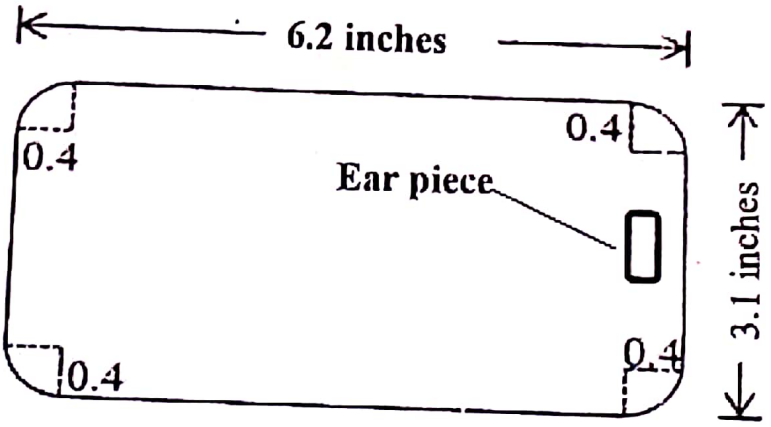
(ii) How far is the party reception from your home using the direct route?

(b) What time would you have to leave home for you to reach the party.

ITEM 6

Juma visited a website on the internet which advertises phones for sale. The marked price of **an iPhone 6** plus as advertised is **Shs 2,400,000.** A **5%** discount is offered on cash purchase. **An iPhone 6 plus** can also be bought on hire purchase by paying a deposit of **40%** of the Marked price followed by **18** equal monthly instalments, each equal to ~~0.25%~~ 2.5% of the marked price.

**The** diagram shows the display size of an **iPhone 6 plus** as advertised on the website. The dimensions of the top surface of the **iPhone 6 plus** are given as 6.2 inches by 3.1 inches, where the corners are identical quadrants with radius of 0.4 inches. The area of the earpiece on the screen is **0.0025m²**.




**(a)** Find how much Juma would save by paying cash for the iPhone 6 plus than by hire purchase

**(b)** After Juma buying the iPhone 6 plus, he wanted to get a screen guard for this phone. The screen guard is to cover the top surface completely leaving out only the area for the earpiece uncovered. What will be the area of the screen guard Juma should buy.

**Note: 1m = 39.4inch**

**END**