EXODUS COLLEGE SCHOOL – WAKISO

S.5 END OF YEAR EXAM 2025

S475/1 SUBSIDIARY MATHEMATICS

DURATION: *2 hours*

INSTRUCTIONS

- ***Attempt any THREE ITEMS of your choice in the time allowed.***
- ***Begin each item from a new page.***

ITEM 1

At Exodus college school – Wakiso, the DOS's office conducted a survey among **150 S.5 business class students** who offer their subject combinations.
Each student had the option to offer **Mathematics (M)** and/or **Economics (E)** as part of their study program.

From the records obtained:

- 90 students offer **Mathematics (M)**
- 80 students offer **Economics (E)**
- 50 students offer **both Mathematics and Economics (M ∩ E)**

The rest offer **neither** of the two subjects.

To further understand the relationship between gender and subject choice, the following information was also collected:

- 60% of the students are **male**, while 40% are **female**.
- Among the male students, **55%** offer **Mathematics**.
- Among the female students, **50%** offer **Mathematics**.

TASK

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A student is selected **at random** from the class.

a) Find the **probability** that a randomly chosen student offer;

   i. Mathematics only
   ii. Economics only

a) If it is known that a student offers **Economics**, find the probability that the student also offers **Mathematics**.
b) If it is known that a student offers **Mathematics**, find the probability that the student also offers **Economics**.
c) Using a tree diagram, find the probability that a randomly chosen student is;

   i. A **male who offers Mathematics**
   ii. A **Mathematics student**, regardless of gender

ITEM 2

Your family is designing a parking lot for day and night parking of motorcycles using the piece of land that has been just been bought in the middle of the city centre. The land is rectangular in shape with a length of 3m longer than the width and the area of this portion is $108m^2$

The school agriculture club one day decided to make a garden of tomatoes, cabbages and onions as their project. The total garden they made was a rectangular in shape of length **(x + 5)** meters and width **x** meters. Before planting they divided the land in to four portions where one part was left free after planting as shown in the figure below. Take note of the following records;

The total area of the rectangular land is $66m^2$

The area covered by onions is square of 2m by 2m

The free land, has Xm by 5m dimensions.

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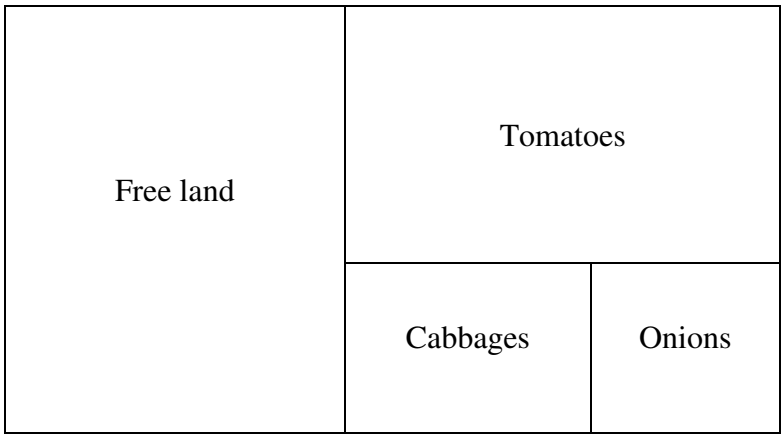

TASK

a) Help your family to find the length and width of land that was to be used for parking
b) Help the club members to know the width x of the land.
c) What is the area of the free land that was left unplanted?
d) What is the area covered by the tomato and cabbage plantations?

ITEM 3

A school nurse keeps a record of the height measured to the nearest centimetres of a group of students she treats for a certain infection at the school clinic. The data was summarized in the table below.

Height (cm)	Number of students
110 – 119	1
120 – 129	3
130 – 139	10
140 – 149	28
150 – 159	65
160 – 169	98
170 – 179	55
180 – 189	15

It is assumed that the mean height of students is 154.5cm and the school administration wants to find out the average height and the height in which the greatest number of students treated falls.

Task:

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(a) Determine the average height of students measured.

(b) Use a suitable graph to estimate the height in which the greatest number of students treated for the infection at school clinic falls.

ITEM 4

A farmer in a certain village has visited a statistician to help him analyze his production per year of the crop he produced so that he can decide whether to change to a new seed variety, he plans to buy a new seed variety if the commonest mass-produced falls below 55kg. He stored his valuable information about the grain production in his house. Unfortunately, part of his information was destroyed by rats due to poor storage. Luckily enough a certain page with this table was spared as shown below:

Mass (kg)	9.5-19.5	19.5-29.5	29.5-39.5	39.5-49.5	49.5- 59.5	59.5-69.5	69.5-79.5	79.5-89.5
Number of bags.	50	115	210	315	410	485	550	590

Task

Help the farmer to:

(a) Retrieve the original information about his production in a frequency distribution table, and determine the mean production per year.

(b)

(i) Determine the commonest mass of grains he produced last season so as to plan well for the next season.

(ii) Will the farmer change to a new seed variety?

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ITEM 5

In Banda village, a shop keeper has a shop selling agricultural products more especially cereals, he has been puzzled about the developments of his sales since last year, however some information was found but not analyzed enough. The table below shows the prices and quantities of four cereals **P, Q, R** and **S** used to make a food product in 2024 and 2025.

	2024		**2025**	
Cereals	**Quantity (kg)**	**Price (shs)**	**Quantity (kg)**	**Price (shs)**
P	25	7500	40	16000
Q	30	12000	50	15000
R	10	8000	25	10000
S	20	12000	15	12000

100 sacks of a given type of cereal were tested to determine quality, Q and the results were as shown below. All Qs are given to the nearest integer.

IQ	45-	55-	65-	75-	85-	95-	105-	115-125
Number of sacks	1	1	2	6	21	29	24	16

TASK

Help the shop keeper to;

a) Calculate the simple price indices for the cereals based on 2024.
b) Calculate the composite index.
c) Calculate the mean and mode of the quality of cereals

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ITEM 6

ITEM 3

In Wakiso district, the Head teacher of a certain school wanted the predict the possible number of first grades they expected in 2023. One of the members of academic committee suggested that the should consider the performance of the class by using the number of first grades the class has been getting since senior one in 2020. The table below shows the number of first grades scored by a class for the years 2020 to 2023. X is the number of first grades expected at the end of 2024.

YEAR	**FIRST GRADES**		
	1st term	**2nd term**	**3rd term**
2020	72	80	84
2021	76	92	80
2022	96	100	98
2023	102	108	X

TASK

As a sub-mathematics student, help the academic committee the given data;

i) By Plotting the first grades and the 3-point moving averages on the same graph.

ii) From the graph, predict the number of the first grades (X) obtained in the 3rd term of 2023.

iii) Comment on trend of the performance.

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