

MENTOR SECONDARY SCHOOL LIRA
MAGDALENE CAMPUS
UGANDA CERTIFICATE OF EDUCATION
END OF TERM 1 EXAMINATION
S.4 MATHEMATICS

Time allowed 2 hours 15 minutes

INSTRUCTION TO CANDIDATES

This paper consist of six items. Answer any four items.

Section A has compulsory items.

Answer any two items from Section B

Additional item(s) answered will not be marked.

Begin each item on a fresh page

Silent non-programmable calculators may be used and a mathematical table may be used

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SECTION A

Answer ALL ITEMS in this section

ITEM I

There is a quarantine of all cattle and goats in some parts of Western Uganda especially Mbarara District. The area honorable Member of parliament (M.P) wants to throw for his constituents a celebration party for the success of the Parish Development Model (PDM) and he has invited a lot of guests. However due to the quarantine he can not buy any animals from Mbarara and he has been advised to go to Kayunga where cheap cattle and good Yoghurt can be found. He moves from Mbarara to Masaka which is **160km** North of Mbarara. From Masaka he moves west wards **150km** to Kampala. From Kampala he heads to Mukono which is in the direction **S75°W** which is **90km** from Kampala. From Kampala he heads to Kayunga which is **148km** and south of Mukono.

When he reached Kayunga he bought **400** cows and each costs **UGX850,00** per cow. The farmer and owner of the cow first gives a **5%** discount on each cow plus an additional **10%** discount for any number of cows bought in excess of **250**.

In order to package the yoghurt, he bought two identical types of buckets. A smaller bucket with a base radius of **30cm** and a larger bucket with a base radius of **50cm**. He intends to use the buckets to keep the Yoghurt for his guests. The capacity of the smaller bucket is **45 litres** and he is to buy **4** smaller buckets and **2** larger buckets.

TASKS.

- (a) Direct the honorable MP on the shortest route he should take and the shortest distance between Mbarara and Kayunga.
- (b) Find the total cost he incurred in purchasing the cows.
- (c) What is the maximum amount of Yoghurt be bought for his guests.

(20 Score)

ITEM II

A day school holds a weekly assembly every Monday starting at 8:00 AM. The Head teacher has noticed a trend of learners arriving late for assembly. Since the school gates are opened at 7:30 AM, he decided to collect data from a sample of learners on their

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arrival times in minutes past 7:30 AM to make an informed decision about the assembly's start time. The collected data was as follows:

15, 18, 20, 22, 17, 25, 23, 28, 26, 21
30, 33, 35, 32, 36, 39, 42, 37, 41, 28
45, 48, 29, 31, 26, 27, 30, 33, 34, 31
28, 35, 40, 42, 37, 39, 36, 38, 29, 43
46, 47, 30, 32, 31, 45, 27, 44, 46, 49
52, 53, 55, 51, 50, 56, 57, 58, 59, 51 Task:

- (a) Giving a reason, based on calculations using the data collected, suggest the time the assembly should always start.
- (b) The deputy Head teacher advised the Head teacher to always start the assembly when at least 75% of the students are present. Based on the advise, determine the time the assembly should start.
- (c) If you were the Head teacher, which of the two suggested assembly start times from (a) and (b) would you consider more appropriate and why?

(20 Score)

SECTION B

PART I

answer one item from this part

ITEM 11I

A friend of you makes chapatti and he has been buying items below on credit for the past two weeks.

WEEK 1: He took 2 packets of salt, 3 packets of wheat and 3 litres of cooking oil.

WEEK 2: He took 1 packet of salt, 4 packets of wheat and 2 litres of cooking oil.

He knows that each packet of salt costs UGX 2000, wheat UGX 6500 and cooking oil UGX 7000. He wants to calculate the amount he needs to pay all at once since he got some money without considering item per item but he doesnot know how to do it; so he seeks for your help:

Task:

- a) Which alternative method can your friend use instead of considering per item.
- b) Illustrate to your friend how he can use that alternative method to find out how much he needs to pay altogether.

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(20 Score)

ITEM IV

The Ministry of Health in Uganda is conducting a survey about the existence of malaria in three districts: A, B and C. The ministry will then come up with control measures if the chance of a person testing positive having visited at least one of the districts is above 50%. The Ministry has intentionally selected a sample of people who visited the three districts and tested them for malaria. The test results have revealed that 50 people who visited district A, 60 people who visited district B and 40 people who visited district C tested positive for malaria. Additionally, 20 people who visited both districts A and B, 10 people who visited districts A and C, and 15 people who visited districts B and C tested positive for malaria. The Ministry has also discovered that 20 people who only visited district C tested positive for malaria and 40 people who visited the three districts tested negative for malaria.

Task:

- (a) Determine the number of people that were tested for malaria by the ministry of health.
 - (b) Calculate the probability of a person testing positive having visited at least one of the three districts.
 - (c) Advise the Ministry of health, with a reason based on calculation, whether to come up with control measures or not.
- (20 Score)

PART II

answer one item from this part

ITEM V

Pamungu bought a car in January 2017 from his friend at shs. 12,500,000. If the car depreciates at a rate of 10% per annum. Calculate the value of Pamungu's car by January 2020.

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A Ugandan tourist left Germany for Uganda through Switzerland. While in Switzerland he bought a watch worth 54 Deutsche Marks (Germany currency). 1 Swiss Franc = 1.28 Deutsche Marks

1 Swiss Franc = 1,350 Ugandan Shillings

A secondary school teacher as a requirement by the government pays PAYE every month according to the tax structure below.

Income (shs) per month	Tax rate(%)
01-50,000	5%
50,001 - 100,000	9.5%
100,001 - 180,000	15%
180,001 - 300,000	18%
300,001 - 400,000	23%
400,001 - 500,000	30%
Above 500,000	35%

The teacher earns Shs.760,000 and his allowances include

Marriage allowance - shs.50,000 per month
Water and electricity - shs.60,000 per month
Housing allowance - shs 150,000 per month
Medical allowance - shs.300,000 per annum
Transport allowance - shs.3,000 per day
Paying for insurance and relief - shs.180,000 per annum
Family allowance for only three children. For children in the age bracket
0 to 10 years, shs 12,000 per child,
Between 10-15 years shs. 9000 per
child 15 years and above shs 5000.

Given that the employee has five children, two of whom are aged between 0 and 10, the other two aged between 10 and 15 while the other 18 years. (A month has 30 days

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- (a) Find the value of the
watch in; (i) Swiss Francs
(ii) Ugandan Shillings.
- (a) Determine the teacher's Net-income
- (b) Determine the percentage of his gross income that goes to tax.

(20 Score)

ITEM VI

St. Mary Magdalene is to transport its S. 4 students for fieldwork in Kasenyi. All the 400 students are to be transported using either coasters or buses. Each coaster can carry 40 people while each bus can carry 80 people. The transport department of the school has only 8 drivers on duty and up to four coasters. If the cost of hiring a coaster is shs. 150,000 and that of hiring a bus is shs. 300,000.

While in Kasenyi their geography teacher Mr. Chong visited Mr. Abel's shop from which he found that three shirts and two trousers cost shs. 105,000 at Mr. Abel's shop. Two shirts and five trousers cost shs. 180,000 at the same shop; **Task:**

- (a) (i) Write down the five inequalities representing the above information.
(ii) Represent the inequalities on a graph paper.
(iii) Find the possible number of coasters and buses that can be used and hence determine the minimum cost.
- (b) Find the cost of;
(i) Each shirt and each trouser.
(ii) Three items of each type at the shop.

(20 Score)

THE END

SUCCESS TO YOU ALL

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