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MATHEMATICS
Theory
Paper 1
November 2024
 $2\frac{1}{4}$ Hours



ASK INTEGRATED TEACHER'S EXAMINATIONS BUREAU LTD

Uganda Lower Secondary Certificate of Education

END OF YEAR ASSESSMENT 2024

MATHEMATICS PAPER 1

(Theory)

SENIOR THREE

2 Hours: 15 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.

SECTION A

*Answer **all** items in this section.*

ITEM 1

Namuwenge is supposed to pay UGX. 5,000,000 per year at the University. This amount is divided in the ratio 4:3:3 for her fees, accommodation, and meals respectively. She is supposed to pay 51% of the fees in the first installment, pay a third of the remainder on the fees in the second installment and the rest of the fees in the third installment.

Namuwenge is supposed to get the money for fees from a mobile money Agent using a 4-digit code. For safety reasons, her father gave her the code written as 342 in base ten and she has to convert this code to base six to get the actual code.

TASK:

- (a) How much will Namuwenge pay for fees in the last installment?
- (b) How much money will Namuwenge pay for Accommodation?
- (c) Help Namuwenge to determine the actual 4 digit code for withdrawing the money from the Mobile Agent.

Item 2

Mr. Chemonges a Tailor operates a small business by making Dresses and Shirts.

After being trained by a local NGO on how to improve small businesses and earn more he started to keep records about his daily operations ensuring minimum costs of production. The production includes both shirts and dresses and should produce not more than 14 altogether.

In one week, he makes at least 4 dresses, and not more than 7 shirts. The number of shirt he makes is more than two – thirds of the number of dresses.

The profit he makes on one dress is UGX. 10,000 and the profit on a shirt is UGX. 6,000.

TASK:

- (a) i) Express the conditions for producing shirts and dresses as inequalities.
 - ii) Show the feasible region of the conditions on the Cartesian plane.
- (b) i) Help Mr. Chemonges to determine the smallest number of dresses and shirts he makes in one week to minimize the cost of production.
 - ii) Find the largest profit he can make in one week.

SECTION B

PART I

Answer ONE item from this PART

ITEM 3

At Nabumali High School, the entertainment Prefect is tasked to select two types of movies to entertain students over the weekend.

The options available are: Romance (R), Musical (M), and Adventure (A).

The Prefect aims to choose two movie types that students enjoy, ensuring the combined preference probability that falls within the range of 0.5 to 1.

The research conducted reveals the following preferences among students;

430 like Romance, 460 like Musical, and 340 like Adventure. 180 like both Musical and Adventure, 260 like both Romance and Musical, 150 like both Romance and Adventure, and 60 students are not interested in any type.

The number of students who like all the three types is twice the number of these who like only Romance and Adventure.

TASK:

- (a) Help the entertainment prefect to determine the:
 - I. Number of students who like all the three types of movies
 - II. Total number of students surveyed.

- (b) Find the probability of selecting two movies types that students enjoy, ensuring the probability falls within the range of 0.5 to 1. Give a reason for your choice.

Item 4:

In preparation for the upcoming national voter Registration drive in Uganda, there Electoral Commission needs to determine the optimal opening time for Registration centres across various districts. This decision aims to facilitate maximum voter Registration and ensure efficient processing of the data of the citizens eager to participate in the upcoming elections. Here are the arrival times of citizen at a sample voter Registration centre in Nabumali Corner in minutes past the selected opening time. (8.00am)

11	66	21	88	33	67	41	27	62	32	43	31	34	66
26	75	80	45	12	41	58	56	63	68	21	21	65	68
45	20	48	63	47	21	42	72	41	36	38			

Task:

- Based on the class interval of 10mins and the calculations using the collected data, suggest an opening time for voter Registration centres.
- Following advice to open registration centres when at least 50% of expected citizens have arrived, determining the opening time.
- Help the Electoral Commission of Uganda, which of the two suggested opening times from (a) and (b) would you choose and why?

PART II

Answer ONE item from this section

ITEM 5

Okurut is tasked to take Company drinks from the Century Bottling factory to three trading centres. The Truck he is going to use has 50 litres of fuel and it uses one litre of fuel for every 20km. He left the factory to the first trading centre which is 70km away on a bearing of N 60° E. He then moved Eastwards at an average speed of 80km/hr for 30minutes to the second trading centre. From this centre he took a bearing of 200° and moved a distance of 60km to the third trading centre.

At this centre he was shown a direct route that would take him back to the factory but was not sure whether the remaining fuel in the Truck was enough for that journey since he did not know the distance.

TASK:

Help Okurut to determine;

- The distance of the direct route from the third trading centre to the factory.
- Whether the remaining fuel in the car will be enough for the journey using the direct route.

Item 6

Sarah has a room that she plans to use as a hair Salon. She has wall paper of 4.7m^2 . The wall she plans to cover with paper is 240cm by 300cm. She knows the wall paper she has is not enough. So she needs your advice on how much more she should buy. A roll of 10m^2 of wall paper is sold at UGX. 32,000

She also plans to use three employees and pay each of her three employee a Gross monthly salary of UGX. 350,000. The Gross monthly salary includes a non – taxable transport allowance of UGX. 90,000; and a Health insurance of UGX.40, 000. However, before he pays them, she has to deduct income tax as a requirement by the tax authority. The tax bands are shown in the table below:

Monthly Taxable income in Shs UGX.	Tax Rates (%)
0 -----100,000	0
100,001-----200,000	5
200,001-----300,000	15

Sarah is having difficulty in using the tax bands.

TASK:

- (a)
 - i) How many more square metres of wall paper should Sarah buy?
 - ii) How much will she pay for the extra wall paper?
- (b)
 - i) What is the total amount of income tax Sarah will deduct from her employees?
 - ii) How much will she pay each of the employees as Net Salary?

END



Total scores	
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AITEL END OF YEAR ASSESSMENTS

Uganda Certificate of Education

DO NOT WRITE YOUR SCHOOL/ CENTRE NAME OR NUMBER ANYWHERE IN THIS BOOKLET

Candidate's Name.....

Signature.....

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