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MATHEMATICS
Paper 1
2024
 $2\frac{1}{4}$ hours

PRE-REGISTRATION EXAMINATIONS-2025

Uganda Certificate of Education

MATHEMATICS

Paper 1

2 hours 15 minutes

INSTRUCTIONS TO CANDIDATES:

*This paper 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 sheets provided.*

Graph paper is provided.

Silent, non-programmable scientific calculators and mathematical tables with a list of formula may be used.

SECTION A

Answer **all** items in this section.

Item 1

Esther a S.3 student in your school has her father and mother working overseas. Her father visits her after every two terms, while her mother visits her every after four terms. Both parents last visited her in third term of her **S.2**.

This term the school fees was increased to one million fifty thousands shillings. Because she is part of the school dance spot team, the school pays sixty percent of the school fees. The rest of the fees is paid by her father and mother in the ratio of **5: 2** respectively. Her father has spared **UGX 365, 000** to cater for her school fees and her pocket money.

Task:

- (a) Help Esther know when she will be visited by both her father and mother.
- (b) Assist Esther find how much she will receive from her father as pocket money.

Item 2

A farmer in Namayina Village Wakiso district is planning to cultivate $500m^2$ of land to plant Irish potatoes and tomatoes. In the first season last year, he hired **3** women from the neighboring village to clear $100m^2$ while in the second season he hired **5** women to clear $300m^2$. He doesn't know how many women he needs this season to clear the intended land size.

This season he is planting Irish Potatoes and Tomatoes at the same time. He is planting *at most* 3 bags of Irish potatoes. He has been told that the total number of boxes of seedlings of both Irish Potatoes and Tomatoes *must not be less than* 6, and because of space, the number of boxes of tomatoes *must be less than* 6. Each box of Irish potatoes yields **UGX180, 000** while each box of tomatoes yields **UGX 200, 000**. He wants to obtain maximum yields.

Task

- (a)
 - (i) Formulate a mathematical relationship between the number of women and the size of land cleared.
 - (ii) How many women will he need to clear the land this season.
- (b)
 - (i) Write down mathematical inequalities to represent the above conditions.
 - (ii) Show clearly the feasible region on a Cartesian plane.
 - (iii) How many boxes of Irish potatoes and tomatoes should the farmer plant in order to obtain maximum yield.

SECTION B

This section has two parts; **I** and **II**

Part I

Answer **one** item from this part

Item 3

The ministry of health through Mulago Hospital has embarked on efforts of reducing Tuberculosis(TB). The director of the hospital has tasked the laboratory technician to provide information on the ages of all patients who tests positive to TB to find out which age is likely to recover from TB. The table below shows the ages of the patients that visited the hospital last month

57	12	71	83	66	25	51	33	62	54
17	54	19	73	45	70	62	51	94	38
23	44	43	20	40	72	36	43	37	28
64	25	59	61	42	37	41	65	89	57
55	58	45	72	69	78	59	35	57	23

The doctors noted that 60% of the patients recover from TB.

- (a) What is the average age of the patients that visited Mulago last month.
- (b) What age is likely to recover from TB.

Item 4

St Francis community hospital in Mityana district usually orders for 50 boxes of paracetamol, 10 boxes of zinc tablets and 30 boxes of vitamin C tablets quarterly from the National Medical Stores (NMS) while St Luke health center(IV) orders 60 boxes of paracetamol, 10 boxes of zinc tablets and 20 boxes of vitamin C tablets.

When Covid-19 pandemic broke out, the health centers increased their orders thus affecting the budgets. St Francis increased its orders by 5 on all drugs, while St Luke health center increased its order by 2.

A box of paracetamol costs **UGX50,000**, a box of zinc costs **UGX75,000** while a box of vitamin C costs **UGX40,000**. The district health officer wants to request for extra funds due to increase in the budgets for the two health centers.

Task

Help the district health officer account for the extra budget to be requested to cater for the increase in the number of drugs.

Part II

Answer **one** item from this part

Item 5

Super Star Hotel is faced with a problem of water supply. The owner has instructed the Hotel Manager to contract **Water Serve Ltd** a water fetching company in the locality to fill the newly bought water tank at the Hotel. Water is fetched using Jerry cans as shown below.



The Hotel tank has a base of diameter 280 cm and height of 4 m and the jerry cans are of dimensions of 20 cm by 25 cm by 40 cm. The cost of water from the Commercial Reservoir is **UGX 5** per litre. (**1 litre = 1000 cm³**). The transport charge per Jerry can is **UGX 300** . (Use $\pi = \frac{22}{7}$).

Task

- Help Water Serve Ltd find how many jerry cans required to fill the tank.
- Help the Manager of Quality Star Hotel know the cost of filling the tank.

Item 5

Twakowa Tukole self-group is a saving scheme of civil servants with a membership of ten people who each save \$40 per month. The group lends members basing on their monthly net income. Judith a member of the group has approached them for a loan and she earns a gross monthly income of UGX850,000 without any allowances. She pays an income tax according to the following tax bands

Taxable income (UGX)	Tax rate (%)
1–235,000	0
235,001–375,000	10
375,001–490,000	20
Above 490,000	30

The group lends four time the net income of a member's net income at a compound interest rate of 10% per annum at four a period of two years. Each member is supposed to return this money in 10 equal monthly installments. Judith does not know how much she will pay back per month.

Task

- What is Judith's monthly installment on the loan to be taken.
- Help Judith determine how much she will remain with after all deductions are made.

END