456/1
MATHEMATICS
Paper 1
2025
$2\frac{1}{4}$ hours

EXTERNAL 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

Meat Akua, a market vender who sells fresh pineapples in Nakasero central market. She buys her produce from farmers in nearby villages.

Akua bought 12 crates of pineapples, each containing 15 pineapples, from farmer Kofi's farm. She sold 30% of the total number of crates before her long-time friend, Kwame came to visit.

Kwame took Akua out for a dinner at a restaurant where they spent Sh 25,000 on each plate of food and Sh 8,100 on drinks altogether. Kwame informed Akua about his Music Studio visit and inspired him to join. Kwame informs Akua that he visits the studio after every five days and Akua also promised to visit the same studio after a week. They agreed to also start a Joint business with Kwame investing Shs 800,000 and Akua investing Shs 600,000, fore casting a gross profit of Shs 2,400,000 by the end of the year. They also agreed to save 20% of the profit for re-investment and 30% of the remainder to pay their workers in the business. They also agreed to share the remaining profit in the ratio of their initial contributions. Kwame deposited Akua's share on his mobile money phone number without noticing him, unfortunately Akua had forgotten the pin to withdraw the money but he had written 159 in decimal base which must be converted to base four to get the correct pin.

Task

(a) After how may days will Akua and Kwame meet again at the music studio?

(b) How much money in words did Kwame spend on the dinner outing?

(c) If Akua repacked the remaining pineapples into new crates of 9, how many crates did she get?

(d) What percentage of the total number of pineapples is damaged if $\frac{1}{8}$ of the remaining crates were damaged?

(e) How much will each person get at the end of the year from the joint business and what do you think was Akua's correct pin for money.

Item 2

Joshua Kiprotich is an athlete who has been invited to complete in 384km distance marathon run in 2025. But previously 2023 according to his records he run 48km in 2 hours and 168km in 7 hours.

Additionally, the common wealth Athlete committee is organizing an open Marathon party for the participants from different countries. The cost of renting a party garden is UGX 2millions for the evening, they have also to budget for food which will cost approximately UGX 20,000 per person. The committee needs to ensure the total cost of the evening stays within their budget. The committee has a maximum budget of UGX 5millions.

Task

(a)   After how many hours will it take Kiprotich to run the 384km if he runs at the same rate from 2023 to 2026?

(b)   Write down the equation connecting the total cost of the evening party with the number of people.

(c)   Find the total cost for the 20 people attend.

(d)   Find the greatest number of the people the committee is able to invite.

SECTION B

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

Part I

Answer **one** item from this part

Item 3

A poultry farm, Green Acres, has three units: Sunrise, Meadow and Harvest. Each unit produces eggs and broilers, with the following monthly output.

Sunrise: 25 trays of eggs and 25 broilers

Meadow: 50 trays of eggs and 20 broilers

Harvest: 40 trays of eggs and 15 broilers

The farm sells each tray of eggs for shs4,500 and each broiler for shs6,000.

To optimize the packing process, the farm owner Mr. Smith, decides to weigh a sample of 900 eggs and classify them according to their mass (in grams). The frequency distribution of eggs' masses is

Mass in grams	35−39	40−44	45−49	50−54	55−59	60−64
Number of eggs	40	180	320	350	120	30

Mr. Smith plans to pick eggs in given weights to cater for different customer preferences.

(a)   Determine the median Mass of an egg to the nearest value from the given frequency distribution to understand the central tendency of egg's weight.

(b)   What would be the percentage of eggs that would be classified as large (over 54 grams)

(c)   Find the total sales of the farm if all the eggs and broilers were sold.
         If the farm charges a 20% VAT, find the total income from the sales of the farm every month.

Item 4

In Buyo Village, many animals die before they make 12 months. A survey by doctors indicates that the animals die with signs and symptoms of either bacterial sinusitis, skin infection or cough. Veterinary doctors are planning for medical intervention to help Buyo Village and have suggest that a quarantine be imposed if atleast 60% of the animals die with more than one disease.

Of the 92 animals who died last year, 71 had skin infection ,72 had bacterial sinusitis and 45 had cough. 51 had skin infection and bacterial sinusitis, 39 had skin infection and cough while 39 had cough and bacterial sinusitis.

Task

Guide the doctors planning for medical intervention for Buyo Village on whether to impose a quarantine.

<div align="center">

Part I
Answer **one** item from this part
</div>

Item 5

Mr. WAGUWENDA is a sales agent who works on behalf of Mr. LIVINGSTONE in his party dress shop in Jinja city. Each dress cost UGX 100,000. Mr. Livingstone has instructed him to take a commission of 15% on the total sales he makes and give the remainder to the business owner.
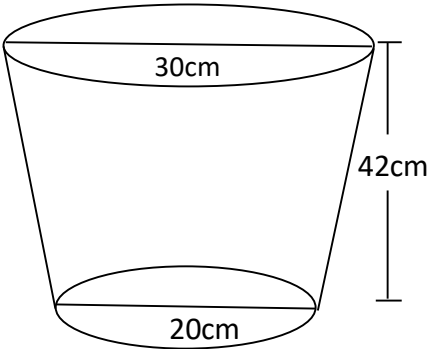
One day Mr. WAGUWENDA the sales agent received on order from clients who wanted 15 same party dress and He has to travel from his home Mukono to the shop in Jinja to meet his customers. He used a tax and found himself in Lugazi town. Mukono is on a bearing of 025^0 from Jinja and about 600km, while Lugazi is about 300km to west of Jinja.

Tasks

(a)   As a math student, help us to determine the distance from
    (i)   Mukono to Lugazi
(b)   What is the bearing of
    (ii)   Lugazi from Jinja?
    (iii)   Lugazi from Mukono?
(c)   Determine how much money Mr. Waguwenda should give Mr. Livingstone after taking his commission?

Item 6

A bucket is in shape of a frustrum with an open end of diameter 30cm and a bottom diameter of 20cm. the bucket which is 42cm deep is used to fill an empty cylindrical tank of diameter 1.8m and Height 1.2m

<div align="center">

4
</div>

Three hundred and sixty litres of a homogeneous paint is made by mixing three paints **A**, B and C. The ratio by amount of point **A** to point **B** is 3:2 and that of **B** to C is 1:2. Paint A costs shs 1800 per litre paint **B** costs shs 2400 per litre and paint C shs 1,275 per litre Taking $\pi =3.142$.

Task:

(a) (i) Determine the capacity of the bucket in litres correct to 3dp.

(ii) The capacity of the tank in litres correct to 2 dp.

(iii) The number of bucket that must be drawn to fill the tank.

(b) (i) The amount of each paint in the mixture

(ii) The amount of money need to make 1 litre of the mixture

(iii) The percentage profit made by selling the mixture at shs 2,210 per litre.

END