Candidate'sName:…………………………………….Signature: ………………...…

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MATHAMATICS

Paper 1

2024

$2^1/_2$ hours

B.PETER'S ACADEMIC PLATFORM

UGANDA LOWER SECONDARY CERTIFICATE OF EDUCATION

ASSESSMENTS TO CANDIDATES

MATHEMATICS PAPER 1

SENIOR   FOUR

INSTRUCTIONS TO CANDIDATES:

This paper consists of **several** examination items.
 Answer **all items for your good academic performance** all.

Item 1

Mr. Karim the head of mathematics department organized a mathematics study trip to Namanve where assembling of Toyota vehicle and manufacturing of Coca-Cola products are done, and in his report to the members of mathematics department shows the cost of hiring a school bus is constant for any a bus and other varies as the distance covered by the bus. He later reviled that if a bus covers 100km then charged kshs.4500 and kshs.4000 for a distance of 60km. The distance between the school and Namanve is 480km and they expected to live the school at 8:00am at an average speed of 100km/hr according to the school's study trip rules and procedures and after the trip they students would rest for forty-five minutes and then proceed back to school.

Tasks:
a) As the treasure of the mathematics department help Mr. Karim to know total expenses for the total journey.

b) By representing the journeys on a suitable graph explain the motion of the bus to the bus to the school administrators.

ITEM 2

At Elijah's enterprise, a company that makes books. A machine produces the least number of books per turn, that enable packing in boxes in equal numbers of 24, 30 and 32 without any book being left out. On a given day, a school made an order of 1440 books. Determine the least number of turns the machine has to make in order to supply the school.

ITEM 3

Mutebi had UGX.750,000 on his account and he wanted to buy a Washing Machine. He went at the shop and the price of the machine was UGX.960,000. He went home and waited. One month later, the price was decreased by 15% and then 9% in the second month. Was Mutebi able to buy the Machine after the decreases? If yes, was he able to remain with any balance.

ITEM 3

The population of Uganda is estimated to be the fastest growing population in Africa. It is estimated to be increasing by over 1,340,000 people every year Since 2020 whose population was estimated to be 49,718,000 people. The research team finds it difficult to present such big population values in 2020 and 2022 on a chart. Advise the search team on some other way they can present these big population values in a reduced way without changing the meaning.

ITEM 4

Kevin's goal is to find a job that provides an income of at least 40 million a year. A glass mart company offers Her a job paying a basic salary of 12 million a year plus a commission of 6% of her sales. Determine what Kevin's total sales will need to be for her to have a yearly income greater than or equal to 40 million.

ITEM 5

An engineer standing on a ramp at (400ft, 300ft). the ramp rises 195 feet over a horizontal distance of 3000 feet to reach the top car parking yard.

Determine the equation that would help the engineer know the displacement for any other

position on the ramp.

ITEM 6

In the press release by the Uganda bureau of Statistics, presented all Items Index and related Annual Inflation rates for 3 major components, between February 2015 – February 2016. The Annual Food Inflation decreased to 10.1 per cent for the year ending February 2016 compared to 12.8 per cent recorded for the year ended January 2016. On the other hand, the Annual Non- Food Inflation increased to 6.7 per cent for the year ending February 2016, compared to the 5.8 per cent recorded for the year ended January 2016.
Key Drivers for higher Non-Food inflation were Transport (10.7 per cent), Clothing and Footwear (13.1 percent) and Miscellaneous Goods and Services (6.3 per cent).

ITEM 7

The small individual farmers in a certain village are being cheated by the traders from towns by offering them low prices for their produce. These farmers decided to form groups and sell their produce through them at better prices.

So far, they have two groups, Kamukamu and Tweziimbe. In the current season, they are selling milk, maize grain and beans. Last month, Kamukamu group had sales of 2,520 litres of milk, 35 bags of maize grain and 10 bags beans. Meanwhile the Tweziimbe group had sales of 2,314 litres of milk, 41 bags of maize and 9 bags of beans.

This month, the Kamuka group had sales of 3,254 litres of milk, 42 bags of maize and 8 bags of beans while the Tweziimbe group managed to sell 2,719 litres of milk, 32 bags of maize and 11 bags of beans. The price for 1litre of milk, 1kg of maize and 1kg of beans is UGX. 700, UGX.1,000 and UGX.3,500 respectively. A bag of maize and beans is estimated to have 120kg each.

Organize the information for the two periods and use it to determine the total sales of both groups.   (15)

ITEM 8

On a certain village of 40 families, it was found out that 12   families keep a dog (D), 18 families keep a cat(C), 10   families keep a hen (H), 5 families keep D and, 7 keep C   and H and 4 keep D and H. 3 families keep neither of the three dogs, cats or hens. This data was collected by   learners, by use of a venn – diagram, help them to find the   number of families that keep all the three animals and birds. If you are tasked to share 1600kgs of feeds to families
depending on the number of how much animals in that group, show each section on the venn – diagram will get.

ITEM 8

Ben and Musa went to borrow money from the same Bank.   Ben opted for simple interest of 8% per annum for two years   while Musa opted for compound interest of 5% per annum for two years. If each borrowed 600,000/=. Help them to   know who paid more money and by how much so they can   know the cheapest alternative in case they are to borrow money for the second time.

"Get yourself a Boda – boda cycle on loan term. Pay   600,000/= cash as deposit and 100,000/= per week for 80 weeks. One of the boda- boda ridder has asked you to   help   him compute the total cost of the Boda- boda cycle   at the end of 80 weeks. Show how you can help him.

ITEM 8
A farmer has a metal sheet of length 12m which must be used   to form a right angle. The hypotenuse of the triangle must be   5m. Help the farmer to get the measurements of the other two sides of the cage.
(b)In a certain factory the production of product T depends on the amount used of product X. the system of production is related by the equation $f(x) = x^2 + 1$. If during

a certain week variables of x where (3, 4, 5, 6, 7, 8, 9), Help the farmer of the
factory to determine the expected range of product T.

ITEM 9

A census enumerator has been sent to count people in your village. He has been given
an i-pad that is fully charged for the exercise. Unfortunately, there is a small note of
the PIN to help you access the software for the exercise. The note indicates that the
pin
number is a two digit number in base ten. This number is equal to five times the sum
of
the digit. It is also nine less than the number formed by interchanging the digits. The
enumerator comes to your home and seeks assistance to to help him find the PIN for
the i-pad.
The census in Uganda is held every after 10 years. It was last held in 2014 and then
previously 2004. The census in 2024 has revealed that there are **14, 400** people in
your village. This has increased by **60**% as revealed by the census in 2014 having
been
previously increased by by **80**% earlier in 2004.
The enumerator claims for transport refund every after four days, for the 4-day
journey
made in the exercise. He travels a certain amount on the first day, then half of that on
the second day, third of that the third day and finally a quarter of that on the fourth
day.
The enumerator travelled a total distance of 50km during the four-day exercise. Each
kilometer travelled is paid UGX28,000
Task:
(a) Help the enumerator encrypt the **PIN.**
(b) How many people were in the village in 2004.
(c) How much did she receive on each day.

ITENM 10

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 other portion of the land is a car park that will have only
taxi and bus. Taxis are allowed $100n^2$ and buses are allowed **200n^2**and there is only
500n
of parking space available. Not more than 40 vehicles are allowed at a time. There
are

always both types of vehicles and at most 15 taxis are allowed at a time. The parking
fee for
taxis is **UGX5, 000** and that of a bus is **UGX8, 000**.

Each bus carries **78** passengers when full. The bus has a total of **30** seats, some of the

seats are for **3** passengers and others are for **2** passengers.

Task:

(a) Find the dimensions of the portion of the parking space for the motorcycles.

(b) How many vehicles of each type should be parked in the parking lot to
 maximize income?

(c) Determine the number of seats for the three passengers and for the two
 passengers.

(d) In your view what precautions should be taken when putting in place the parking
 lot.

Item 11

Your father has decided to explore other options for your A-level education since the expenses at the previous school were beyond the budget. After some research, he has found another school that offers a more affordable option. He drove 30km east and 40km north to reach the school and found out that the details of the new school were as follows:

   The school fees are Shs 750,000 per term, an admission fee of Shs 80,000 and the uniformcost is Shs 300,000. The school offers a 60% bursary on the school fees for students who scored a first grade in their O-level exams, and you qualify for this bursary.

Your father is considering the following two payment plans offered by the new school:

   Paying the full amount (school fees, admission, and uniform) at the beginning of the term.

   Paying the school fees in three equal instalments at the beginning of the term, on visitation day, and at the end of the term, while paying the admission and uniform fees upfront.

Tasks:

(a) Calculate the total cost of attending the new school, considering that you qualify for the bursary.

(b) Determine which payment plan would be more suitable for your father's budget and explain your reasoning.

(c) If your father chooses the three-installment plan, calculate the amount to be paid in each installment.

(d) How far is it from your home to school if you travel through the direct route?

Item 12

Basoga Bainho (BABA) FM is hosting a highly anticipated concert, Ekituudha, at Kyabazinga Stadium Bugembe. The concert is expected to attract a large audience and the organizers have set two different ticket prices to cater for different income levels. The concert tickets are being sold at two different prices:

 - Tickets for the VIP seating area are priced at Sh. 10,000 each.

- Tickets for the general seating area are priced at Sh. 5,000 each.

The organisers have a total of 30 tickets available for the concert. After the initial sales period, the total amount raised from the ticket sales is Sh. 800,000.

Task;

As the finance manager for the Ekituudha, determine how many tickets were sold at the price of Sh. 5,000 and Sh. 10,000.

Item 13

Walugosi is a middle-class employee working in a private company in Uganda. He earns a gross monthly income of UGX 1,200,000. Walugosi is married and has four children - two aged 6 and 8, one aged 15, and one aged 19. Walugosi receives various allowances from his employer, including:
- Insurance and relief: UGX 222,000 per annum
- Water and electricity: UGX 21,000 per month
- Medical: UGX 318,000 per annum
- Housing allowance: UGX 55,000 per month
- Transport allowance: UGX 42,000 per month
- Family allowance for the three children under 18 years old.
Walugosi is concerned about the amount of income tax he has to pay each month and wants to understand how it is calculated based on the tax structure below;

Taxable income(UGX) per month			Tax rate (%)
1	-	40,000	8.0
40,0001	-	100,000	16.5
100,001	-	200,000	24.0
200,001	-	350,000	32.5
350,001	-	510,000	43.0
Above 510,000			48.5

Task;
Walugosi approaches you, an expert in tax calculations to help him
    determine, i)The income tax he has to pay monthly.

ii)   His net income
iii)   What percentage of his gross monthly income goes to tax?
iv)   With the help of two relevant example(s), help Walugosi understand
       why it is important to pay tax.

YOU CAN YOUSELF A FULL COPY CONTAING 43
ITEMS AT SHS.5000

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