BWESUMBU PEAS HIGH SCHOOL

END OF TERM ONE 2024

SENIOR FOUR MATHEMATICS ASSESMENT

2hrs 30mins

INSTRUCTION TO CANDIDATE

This examination consists of seven items

Attempt any four items

All items carry equal marks

ITEM 1

A Mathematician gave your friend a carpenter a task of making a rectangular ground floor of a rabbit house. The length of the house is to be $(x + 3)$ and the width is to ym. Its perimeter should be $25m$ and its area must be $25m2$. The mathematician adds that he needs the work to be finished in one day but he has ever contracted $3\ men$ working at the same rate and they only managed to work on $5m2$. To be given this contract, your friend is required to make a clear diagram showing the numerical sizes of the length and width but fails to do so and comes to you for help.

Tasks:

a) Determine the length and width of the floor to be occupied by the house.
b) Make a sketch of the floor your friend can present to the mathematician to get the contract.
c) Determine the number of workers who are needed to complete the house if they all work at the same rate as the group the man has ever used.

ITEM 2

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.

ITEM 3

Your guardian has a budget of Shs700,000 for your school expenses. To get to the school where your guardian wishes to take you for A-level, your guardian drove 4 km east from your home to the stage and then 8 km north to reach there. However, you realized later that there was a direct route from home to school your guardian could have used. On reaching the school, you found out that, the school fees, admission fees and uniform fees are Shs900,000, Shs100,000 and Shs350,000 respectively. The school also offers a bursary of; 60% off school fees, free admission and eighty-seven thousand five hundred shillings off uniform fees to those who got first grade and according to your results, you qualify for this bursary. It also has two payment plans on school fees that the guardians can choose from and they are:

 - Paying in two instalments that is to say; two thirds of the school fees at the beginning of the term and the balance at either visitation day or end of term.

 - Paying in three equal instalments; at the beginning of the term, on visitation day and end of term respectively.

TASK

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

b) Since you qualify for the bursary, how much will you pay? Will your guardian afford the school expenses according to his budget?

c) How much will those who are to pay school fees of Shs900,000, pay per instalment, according to each of the payment plans?

 d) Which payment plan would you recommend for them and why?

ITEM 4

Lwasa a prominent business man in Kiwenda Town wants to start Hardware in the town that is valued at UGX 12.5 millions. He has saved 45% of the required amount with his local SACCO and wants to top up the balance. However he has approached two money lenders Juma and Saidi who lend there money according to the following conditions.

JUMA	SAIDI
He lends at a simple interest rate 15% of per annum payable in 24 equal monthly installments	He lends at a compound interest rate of 7% per annum payable in 24 equal monthly installments.

 Mr Lwasa wants to decide on which of the two money lenders to opt for.

 TASK:As an accountant working with Centenary Bank,

  a) Help Mr lwasa find how much money he intends to borrow.
  b) Which of the two money lenders would you recommend Mr lwasa to opt for.

c) Having selected for Mr Lwasa the right money lender how much does he pay per installment?
d) What will be the saving Mr lwasa would make if he had all the money at the start than going for the loan from this money lender.

ITEM 5

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 t 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 $S75^{O}W$ 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 **UGX850,000** 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.

ITEM 6

The caterer of a school located in Makindye division -Kampala city is required to buy food stuffs for a school party. The foodstuffs to be bought include: 100 kg of rice, 150kgof meat and 200kg of Irish potatoes. The cost is UGX 3500, UGX15,000, and UGX1500 per kg of rice, meat and Irish potatoes respectively in Nakasero farmers' market. The same items cost UGX. 3000, UGX. 12,000 and UGX. 1,100 per kg of rice, meat and Irish potatoes respectively, in Kalerwe farmers' market. To hire a pick-up from Nakasero farmers' market to school costs UGX 60,000 while a pick-up hire from Kalerwe farmers' market is UGX95,000.

TASK
(a) What would be the easiest way to display the information provided above?

(b) Using the information provided above, how would the caterer decide on where to do the shopping from? Justify your answer.

ITEM 7

During a mathematics lesson, Mr. Kumaraki Joseph taught some learners how to reflect different shapes given the line of reflection. You are requested to help the absentees catch up in the next lesson. Given the rectangle with vertices A(3,3), B(6,3), C(6,5) and D(3,5) to be reflect along the line $y = x$ and the image further reflected along the $y = -x$ to obtain another image.

Tasks:

a) Use a graph paper to determine the vertices of the image rectangle hence confirm whether the shape remains the same after reflection.
b) With reasoning help the absentees to know how the area of the object and the image is obtained hence comment on their areas.
c) Suggest the errors one may encounter while reflecting images on the graph paper.

RAISE AND SHINE, THE SKY IS THE LIMIT