

NAME:.....STREAM.....

456/1

MATHEMATICS

Paper 1

2 hours



Uganda certificate of Lower secondary education

S.2 END OF TERM I ASSESSMENT

MATHEMATICS

Paper 1

2 hours

INSTRUCTIONS TO CANDIDATES:

- ✓ *This paper consists of **FOUR** (4) scenario-based items carrying equal marks.*
- ✓ *Answer any **THREE** questions.*
- ✓ *You may lose marks if you do not show **ALL** your working.*
- ✓ *Poor handwriting and untidy work **shall** lead to loss of marks.*
- ✓ *At the end of the examination, fasten all your work securely together.*

Item 1

A certain member of your family re-wrote each digit from number system 10 (base 10) to another base system less than 4. Now he is sick in the hospital, he can neither talk nor write but his account is needed to finance hospital bills. Here is how he wrote the PIN **11 20 22 10**. Assuming that you been able to encrypt the Visa Pin for the family and funds are available to take care of him. The hospital has a nurse who checks on him after every 3 Hrs. and a doctor who checks on him after 2 Hours & 30 Minutes. Both medical personnel last checked on him at 10: 30 am. He was treated well, discharged and advised as follows.

He was advised to spend three eighths of the day resting One Sixth of the day eating, two thirds of the reminder having a healthy diet and the rest of the day visiting the hospital for further checkup.

Task

- a) Which number system do you think he used to re write the pin and why?
- b) Use the identified number system to help your family to regenerate the pin.
- c) At what time did the nurse and doctor check the patient at the same time.
- d) How many hours of the day does he have to spend visiting the hospital?

Item 2

John and James live 80 Km apart. At 7:00 am John left home cycling towards James home at 20 km/hr. At 8:00 am James left his home cycling towards John home at 8 Km/hr. (Use a scale of 1 cm to represent 10 Km on the vertical axis and 1 cm to represent 1 Hour on the Horizontal scale)

Task

- a) On the same axes draw the travel graphs for John and James.
- b) Use your graph to find;
 - i) The time when John reached town B
 - ii) The time when James reached Town A
 - iii) The Time when John and James met.
 - iv) The distance from John`s home when the 2 people met.

Item 3

Okello is an interior designer and has a prospect of installing 3 lamps on the ceiling of a sitting room. He Understands coordinates and his plan for the position of the lamps are A (1,0) B (3,0) and C (1,3) For him to have clear lighting he had to translate the lights to new positions $A^I B^I C^I$ using a translation vector $\begin{bmatrix} 2 \\ -1 \end{bmatrix}$.

Task

- By plotting, find the new position co-ordinates of lamps $A^I B^I C^I$
- The positions $A^I B^I C^I$ are later translated by vector $\begin{bmatrix} -3 \\ 2 \end{bmatrix}$ to $A^{II} B^{II} C^{II}$ for more clear lighting. Find the coordinates for $A^{II} B^{II} C^{II}$ for more clear lighting.
- Find a single translation vector that maps ABC directly to $A^{II} B^{II} C^{II}$.

- *END* -