456/1
MATHEMATICS
Paper 1
July/Aug. 2024
$2\frac{1}{4}$ hours

ASSHU – KASESE JOINT EXAMINATIONS BOARD (AKJEB)

MOCK EXAMINATIONS

Uganda Certificate of Education

MATHEMATICS

Paper 1

2 hours 15 minutes

INSTRUCTIONS TO CANDIDATES

This paper consists 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 (4)** *examination items in all.*
Any additional item(s) answered will not be scored
All answers must be written in the answer booklet(s) provided.
Graph papers are provided
Silent non-programmable scientific calculators and mathematical tables with a list of formulae may be used.

SECTION A

Answer **all** *items in this section.*

Item 1

American tourist visited Uganda. He got accommodation in serena Hotel in Kampala and spent on food and accommodation for the period he stayed in the country. While in Uganda, he went to tour game parks in the country to look at the animals in the national Parks.

The tourist on his arrival in Uganda he had $ 4 500. He spent one third on food and accommodation, three quarters of the remainder was spent on touring game parks and transport. After his stay in Uganda, he decided to visit Rwanda and went to the bank to convert the amount he was left with into Rwandan Currency.
(1 $ = UGX 3 750, 1 Rwandan Frac = UGX. 5.57)
An employee at a mattress factory earns a gross annual income of UGX. 10 500 000. He is entitled to the following monthly allowances; lunch UGX. 55 000, Transport UGX. 115 000, medical one twentieth of gross monthly income, Housing a tenth of gross monthly income.

The income tax deducted from every employee per month was as follows

Income taxable pay (UGX.)	Rate of tax (%)
01 – 235 000	0
235 001 – 335 000	10
335 001 – 410 000	20
410 001 and above	30

(a) As a S.4 student help the tourist to find how much he had left after his period in Uganda. And also determine the amount of Rwandan Franc that he went with to Rwanda

(b) Help the manager of mattress factory to determine the employees net income as a percentage of the monthly gross income.

Item 2:

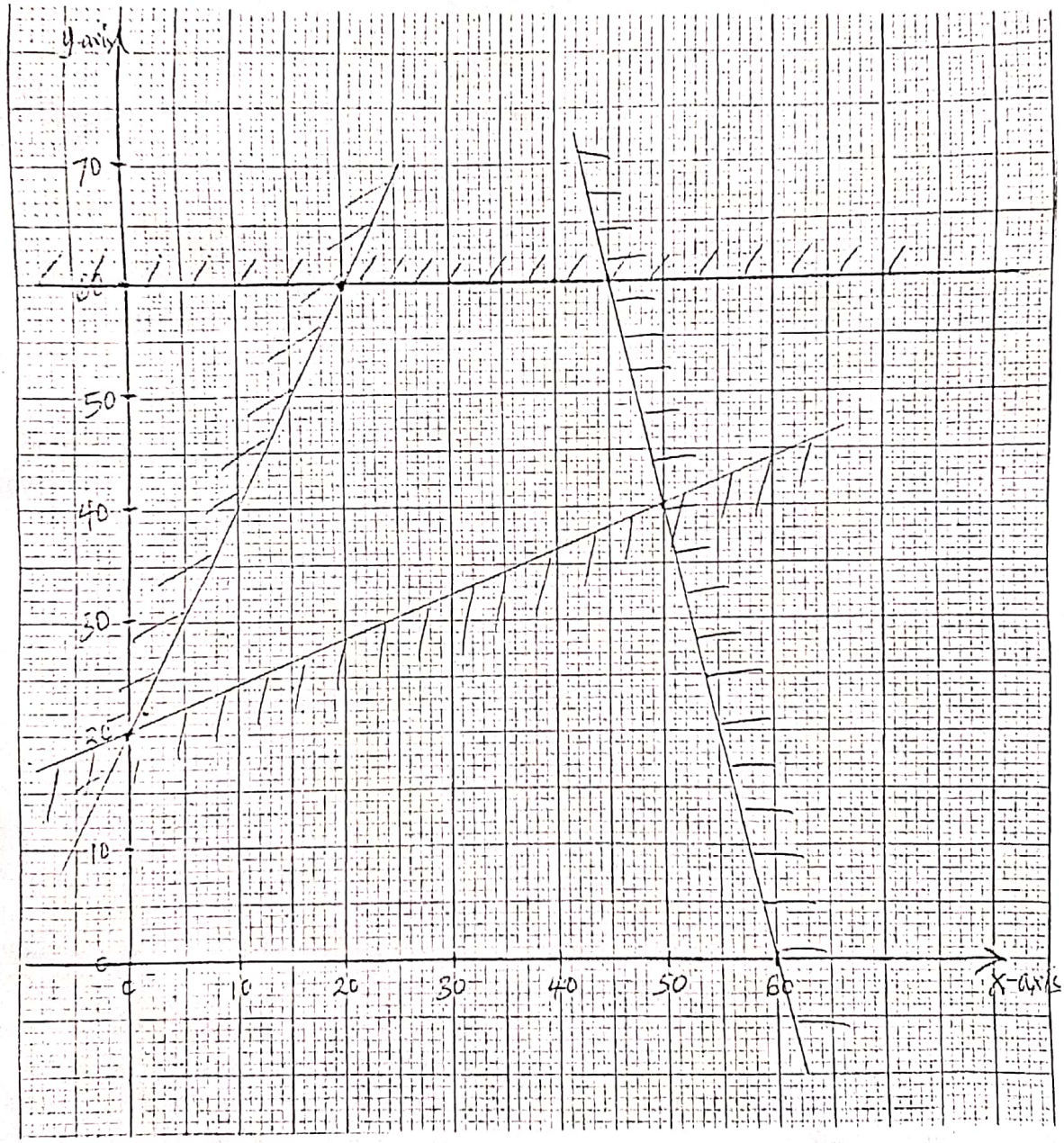
A workshop dealing in metallic beds was given some work by a certain company who needed the work to be done quickly because they wanted to use the beds to host some visitors. The workshop previously had done similar work and used three machines to complete the job in 15 hours.

The manager of the metal workshop decided to increase the number of machines by two to have the work done.

A farmer rears goats, and cows on her farm. During Christmas season this year she wishes to sell some of her animals in four phases according to the constraints indicated on the cartesian diagram below

She projects each goat to yield a profit of UGX. 50 000 and each cow a profit of UGX. 150 000

(Taking x: goats, and y =: cows)



Task:

(a) Help the metal workshop manager to determine how long it would take to complete the work.
(b) As a farm manager, help the farmer to determine the condition in each phase of sales.
(c) How many animals of each type did the farmer have to sell in order to maximise profits.

SECTION B

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

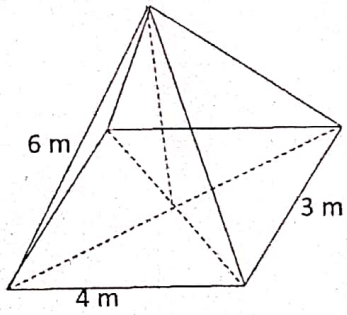
Part I

Answer **one** *item from this part.*

Item 3:

A man wanted some ripe mangoes from a mango tree which he had seen at two different positions. The man who is 1.5 metre tall was 20 metre away from the mango tree where he had seen the mangoes at angles of elevation of 35° and 58° respectively.

During a charity organization retreat members wished to construct right pyramid tents. Each slant edges of the tent was to be 6 metre, while the base was rectangular of dimensions 4 metre by 3 metre.



Task:

(a) As a mathematical student help the man to determine the height of the mango tree and hence the distance between the two ripe mangoes.
(b) Help the director of the charity organization to determine angles between the slant edge and the base. Also find the angle between the slant face and base.
(c) How much money would be spent on the cloth to cover the tent if 1 m^2 costs UGX. 5 000.

Item 4:

The sports department of the district organised a motorist race. Interested motorists participated in the competition but some of the motorists had never taken the routes which were to be taken while cycling. The manager of the competitions decided to describe to the motorists the places they would reach while cycling starting from the district headquarters.

One of the motorists who joined the competitions moved 4 km due North East to the church. He then turned West and moved 3 km to reach the bridge. Finally, he moved at a speed of 15 km/h for $\frac{2}{3}$ hour on a bearing of 315° to the playground.

Task:

(a) As a S4 student, help the motorist to describe the direction of the play ground from the district headquarters.

(b) How much would the motorist save using the shortest route if each kilometre travelled costed UGX 3 000 from the district head quarters.

Part II

Answer **one** *item from this part.*

Item 5:

In a certain village the age of a man was four times as old as his daughter during the census. Eight years ago, the product of their ages was 160 years.

A catering service organization was given opportunity to serve meals to participants at a workshop for two days.

The organization prepared three serving points per day as follows;

Table A had 30 k*g* of Irish potatoes, 15 k*g* of Matooke, 20 k*g* of rice and 10 k*g* of meat.

Table B had 25 k*g* of Irish potatoes, 20 k*g* of Matooke, 18 k*g* of rice and 12 k*g* of meat.

Table C had 35 k*g* of Irish potatoes, 25 k*g* of Matooke, 15 k*g* of rice and 9 k*g* of meat.

The cost of a kilogram of Irish Potatoes is UGX. 4 000, Matooke 2 000 per kilogram, rice costs UGX. 5 000 per kilogram and a kilogram of meat UGX. 18 000.

Task:

(a) Help the census officer to determine the ages of the man and his daughter.
(b) As a member of the catering organisation, help the management to organise the information and use it to determine the total amount spent on food stuffs.
(c) If the company had atmost 1.5 million Uganda Shillings to cater for meals, how much more money did they require to buy all the food stuffs needed for the two days.

Item 6:

A farm school carried out a survey on the yields of maize grains in relation to the heights of maize plants.

The heights of maize plants were measured in centimetre and the sample result below were obtained. The farm school administration decided that plants of height below 586 cm be uprooted to improve on the yields

607	562	638	602	576	615	621	590	632	609
598	599	596	597	583	604	582	582	596	624
618	595	603	555	588	615	618	597	627	597
622	616	563	610	592	571	630	610	560	589
580	599	581	593	600	602	595	575	598	594

Task:

Using classes with equal class width of 10 cm;

(a) Help the management to find;
  (i) The number of maize plants to be uprooted
  (ii) The average and median heights of the plants.
(b) Illustrate the data on a statistical diagram and use it to estimate the modal height.

END