456/1
MATHEMATICS
Paper 1
2026
$2\frac{1}{4}$ hours

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** 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.

Turn Over

SECTION A

Answer **both** *items from this section*

Item 1

A newly appointed production supervisor at Kinyara Sugar Estate in Masindi found that the irrigation control room was secured with a four-digit code. The previous supervisor had left a note stating that the access code was 81 in base nine which was to be converted to the base four to access the irrigation control room.
After successfully accessing the control room, the supervisor reviewed the farm production plan. The estate has allocated: ¼ of the land for sugarcane,35% for maize, and the remainder for beans. It was recorded that 35% of the land for maize covers 70 hectares.
The newly appointed production supervisor also learned that they had to allocate 200 workers in the different farm production in the ratio of their land allocation and he wants to determine the number of workers allocated to production of sugarcanes.

Task:

As a senior four student help the newly appointed production supervisor to they had

(a) Determine the four digital code used to access the irrigation control room.

(b) Determine:
  (i) The total land area of the estate.

  (ii) The area allocated to beans.

(c) Determine the number of workers allocated to the sugar cane production.

Item 2

A trader in Owino Market, Kampala, regularly buys cartons of cooking oil from the same wholesaler. The total amount he pays always includes a fixed transport charge in addition to the cost per carton. The table below shows part of his purchase record:

Cartons purchased	8	12
Amount paid (Shs.)	920,000	1,320,000

He wants to use this information to determine how much he will pay if he buys 20 cartons next time.

Later, he decides to start selling two brands of cooking oil: Brand X and Brand Y, supplied by another wholesaler. Two other traders give him the following information: Trader A paid Shs. 760,000 for 3 cartons of Brand X and 5 cartons of Brand Y. Trader B paid Shs. 880,000 for 4 cartons of Brand X and 6 cartons of Brand Y. He wants to use this information to determine how much he will need to pay if he buys 5 cartons of Brand X and 2 cartons of Brand Y.

Task:

Help the trader to:

(a) (i) Form a mathematical equation connecting the number of cartons purchased and the total amount paid.
(ii) Determine the fixed transport charge.
(iii) Calculate the amount he will pay for 20 cartons.

(b) (i) Find the cost of one carton of Brand X and one carton of Brand Y.
(ii) Determine the total amount required to purchase 5 cartons of Brand X and 2 cartons of Brand Y.

SECTION B
Part I

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

Item 3

A poultry farm has been contacted to supply eggs for 40 days consecutively to an orphanage home. The data below are the actual number of eggs the farm supplied.

138	145	145	149	150	142	154	140
146	135	128	157	164	147	152	138
168	142	135	125	158	135	148	176
146	150	165	144	126	153	136	163
161	156	144	132	176	140	147	130

To cater for all employees and the orphans well, the management of the orphanage has agreed that an average of 168 be supplied, otherwise the contract of the farm will be cancelled.

Task:

(a) Construct a grouped frequency distribution table with equal class intervals.

(b) Determine the median number of eggs the farm supplied.

(c) Will the contract of the farm be cancelled? Justify your answer.

Item 4

A group of 50 students are working on project proposal to make a dust bin that is environmentally friendly. They all agreed to look for plastic bottles that they are to use to make the dust bin, mainly of three water brands: Rwenzori, Nivana and Aquasipi. It was noted and recorded that, 24 students collected Rwenzori bottles, 26 collected Nivana bottles and 29 collected Aquasipi bottles. 9 students collected both Rwenzori and Aquasipi bottles, 13 collected Nivana and Aquasipi while 11 collected both Rwenzori and Nivana bottles. Each of the students collected at least one of the three brands of mineral water bottles. The project supervisor wants to establish the exact number of students that collected all the three brands of mineral water bottles.

Task:

(a) Present the above information using a Venn diagram.
(b) Determine the exact number of students that was able to collect all the three types of water bottles.
(c) Find the probability that a student selected at random was able to collect more than one type of water bottle.

Part II

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

Item 5

To improve medical services on the Ssese Islands, the District Health Office sends a motorboat to deliver vaccines to three islands on Lake Victoria.

The boat leaves Nakiwogo Landing Site at 8:00 a.m. and sails on a bearing of 060° to Buwuvu Island, arriving at 9:00 a.m.

After offloading, the boat sails on a bearing of 150° for 30 km to reach Lulamba Island. From Lulamba Island, the boat then sails due west for 40 km to reach Bukasa Island.

The boat travels at a constant speed of 40 km/h. At each island, the health team spends 15 minutes offloading supplies

Task:

(a) Using a suitable scale diagram, determine:
  (i) The distance and bearing of Bukasa Island from Nakiwogo.
  (ii) The shortest distance from Bukasa back to Nakiwogo.

(b) (i) Calculate the distance from Nakiwogo to Buwuvu Island.
  (ii) Find the time the boat arrives at Lulamba Island.
  (iii) If the boat maintains the same speed, determine the time it will take to travel directly from Bukasa back to Nakiwogo.

Item 6

A certain metal and fabrication workshop has been contracted by your school to make a cylindrical metallic water tank of diameter 12ft and height 2.5m. the tank is made up of metallic pieces of dimensions 8ft by 4ft only each sold at shs 80,000.

They want to paint the outside part of the tank excluding the bottom part with paint which is sold in either jerrycans or cylindrical tins. A sealed jerrycan which costs shs 23,000 can paint $300ft^2$ and a sealed tin which costs shs 14,000 can paint $200ft^2$. Given that 1m=3.3ft.

Task

(a) Determine the number of pieces of material required to make the tank.
(b) How much money is used to buy the required pieces of material.
(c) Should they use paint in jerry cans or tins? Justify your answer. **END**