

**456/1**

**MATHEMATICS**

**Paper 1**  
**2<sup>1</sup>/<sub>4</sub> HOURS**



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# **Apex Examination Council**

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**PRE- MOCK EXAMINATIONS 2025**

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**Uganda Certificate of Education**

**MATHEMATICS**

**Paper 1**

**TIME: 2 Hours 15 minutes**

## **INSTRUCTIONS TO CANDIDATES**

This paper has two sections: A and B. it consists of **six** examination items.

Section A has two compulsory items.

Section B has two parts (Part I and Part II). Choose one item from each part in

Section B.

Answer a total of four items.

Any additional item(s) answered will not be scored.

All answers must be written in the answer booklet(s) provided.

Graph paper is 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**

David and Mark have been diligently saving a portion of their business earnings in a joint savings account. After accumulating a total of 7,080,000 Ugandan shillings, they now wish to divide the savings based on an agreed-upon ratio of 7:3—with David receiving 7 parts and Mark receiving 3 parts. However, David has instructed Mark to give him 0.4 of his share, while the remaining amount will stay in the joint account for future use.

Additionally, David and Mark are planning to launch a new fruit packaging and selling business. Their initial stock consists of:

252 apples

210 oranges

294 pears

They intend to pack these fruits into boxes without wasting any fruit. Their business is growing at a compound growth rate of 12% per year, and they currently generate an average monthly profit of 1,800,000 Ugandan shillings. They want to estimate how much profit they will make in 3 years if the growth rate remains constant.

### **Tasks:**

(a) How much of the savings will Mark give to David? (b) (i) How many boxes can David and Mark create from the fruits they have?

(ii) What will be the ratio of fruits in each box? (c) What will be the expected monthly profit of their business in 3 years, assuming the growth rate remains constant?

## ITEM 2

Maya and Peter, bookstore owners, received an order to package 200 books for a customer. Previously, Maya packaged 48 books using 2 meters of packing tape and 168 books using 7 meters of packing tape. The customer requests that some books be packed in cardboard boxes ( $x$ ) and some in paper wraps ( $y$ ), with the following conditions:

The number of books in cardboard boxes should be more than those in paper wraps.

The number of cardboard boxes should not exceed 100.

The number of books in paper wraps should be at least 60.

The total number of packing materials (boxes and wraps) should not exceed 200.

### Tasks:

- (a) Establish a mathematical relationship between the number of books packaged and the amount of packing tape used.
- (b) Determine the amount of packing tape required to package 200 books. (c) Write down the mathematical inequalities for the number of cardboard boxes and paper wraps.
- (d) Find the maximum number of cardboard boxes and paper wraps they can use.

## SECTION B

### PART I (CHOOSE ONE ITEM)

## ITEM 3

Your school has organized a general election for various posts. The management committee decided that The Head Prefect (HP) of the school must be chosen from Form Five, on condition that to qualify to aspire for the post, students must score more than 60% in the B.O.T II Mathematics paper. Furthermore among those who qualify, students eligible for the open campaign must have

successfully passed both oral and written interviews during the screening process. The Form 5 class teacher submitted Math marks of 50 students to the school's electoral committee as follows:

60, 50, 40, 67, 53, 44, 69, 39, 45, 61, 40, 71, 51, 26, 36, 38, 73, 37, 58, 48, 48, 23, 39, 51, 59, 47, 46, 59, 40, 47, 59, 68, 55, 67, 60, 51, 70, 46, 40, 62, 43, 50, 50, 65, 58, 74, 32, 52, 51, 42

When the campaigning analyzed the class performance, it found out that out of the students who qualified for aspiring on the post of Head prefect and went through the screening interview stage, 5 performed well in oral interviews and 6 performed well in written interviews of which 2 were neither good in oral nor in written.

**Tasks:**

- (a) Based on mathematical calculations, determine whether more students qualified to aspire for the post or not.
- (b) Find the percentage of students who qualified to apply for the post.
- (c) How many students were allowed to participate in the open campaign ceremony?
- (d) Represent the above data on a statistical graph and use it to determine: (i) The number of students who did not qualify. (ii) The median mark.

**ITEM 4**

Two friends, Mark and Grace, recently returned to Uganda after working in the Middle East. At Entebbe International Airport, they exchanged their Bahraini Dinars (BHD) for Ugandan Shillings (UGX) at an exchange rate of 1 BHD = 1,400 UGX. They exchanged 10 BHD. They decided to visit Ssesse Island Beach and later travel to Lake Victoria Resort, 40 km to the southeast. Since no direct road connects these locations, they hired a boat for the journey. The boat traveled: 45 km on a bearing of  $090^\circ$

20 km on a bearing of  $225^\circ$

Before stopping briefly

The boat rental company charges UGX 12,000 per kilometer traveled.

**Tasks:**

- (a) How much did Mark and Grace receive in Ugandan Shillings after exchanging their money?
- (b) From the stopping point, what bearing should the captain follow to reach Lake Victoria Resort?
- (c) Calculate their total transport expenditure for the boat journey.

**PART II (CHOOSE ONE ITEM)****ITEM 5**

In Kasese County, Bundibugyo District, the government has launched a highyield seed distribution program in four parishes: Ekyama, Kabuweji, Konge, and Kibuli. The government procured 42,000 packets of seeds, to be distributed proportionally as follows:

Ekyama receives 25 packets per unit share

Kabweji receives 18 packets per unit share

Konge receives 32 packets per unit share

Kibuli receives 22 packets per unit share

To transport the seeds, two lorries are dispatched:

A Tata lorry from Ekyama, traveling 50 km/h for 1 hour, stops for 30 minutes in Konge, then proceeds to Kabuweji at 60 km/h.

An Isuzu lorry from Kabuweji at 12:30 pm, traveling 40 km/h for 1 hour, then continues at  $V$  km/h, aiming to reach Ekyama by 4:30 pm.

**Tasks:**

- (a) Determine the number of seed packets each parish receives using a statistical diagram.
- (b) Using a distance-time graph, find:
  - (i) The meeting point of the two Lorries.
  - (ii) The arrival time of the Tata lorry at Kabuweji.
  - (iii) The speed  $V$  of the Isuzu lorry.



## ITEM 6

At the school, each grade 8 teacher earns a monthly salary of UGX 1,500,000.

They receive a housing allowance of UGX 350,000, utilities allowance of UGX 120,000, and an off station allowance of UGX 200,000. Teachers are also required to contribute 5% of their gross salary to a social security fund.

However, the school bursar is unavailable due to illness, and teachers must still receive their salary before the trip.

**The country's tax rates are as follows:**

Monthly taxable income	Tax rate (%)
UGX 400,000	10%
UGX 400,001 to UGX 800,000	15%
UGX 800,001 to UGX 1,200,000	20%
Over UGX 1,200,000	25%

### Tasks:

- Calculate the gross salary of each grade 8 teacher.
- Determine the amount of money each teacher contributes to the social security fund.
- Calculate the taxable income of each teacher.
- Determine the amount of tax each teacher pays.
- Calculate the take-home pay of each teacher after taxes and contributions.

**END**