**456/1**

**MATHEMATICS**

**Paper 1**

**April, 2025**

1.5 hours

**Uganda Certificate of Education**

MATHEMATICS

**Paper 1**

1 hour 30 minutes

**INSTRUCTIONS TO CANDIDATES**

*This paper consists of* ***two*** *sections;* ***A*** *and* ***B****. it has* ***four*** *examination items*

*Section* ***A*** *has* ***one*** *compulsory item*

*Section* ***B*** *has* ***two*** *parts;* ***I*** *and* ***II****. Answer one item from each part*

*Answer* ***three***  *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 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**

A woman whose husband lives abroad has been sent money for their two children with instructions on how to spend the money. She has received two million three hundred and eighty thousand shilling only with 40% to be used for the son’s fees and ½ of the remainder on the daughter’s fees, ugx 100,000 is to be used for transport to school and the rest given to the children for their shopping. She has asked you for help on how to allocate the money as instructed but she decided that she would give the children their total amount for them to shop for what they want.

Of the children, the girl asks her brother that they should play a game where the winner will get 3 parts while the loser gets 2 parts of the shopping money. The girl has her card with the number 7 and asks the brother to randomly pick a card out of five cards each with digits in binary base. He is required to convert the number on his card to decimal base. If his number turns out to be greater than that of her sister then he wins. The boy picks a card with the number 1101.

**Task**

(a) Show how you can help the woman to determine the different amount as she has been instructed.

(b) Who of the children will get the most amount of pocket money and how much will it be?

**SECTION B**

**Part I**

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

**Item 2**

The headteacher of Jinja Modern SS is thinking of how he can boost the mathematics department of your school. He can either add another teacher or buy more books or both. He has decided that he will do both if the average performance of this year’s performance for the 50 students is lower than that of the previous which was **64**. He asked the department to give a test and these were the student’s marks.

86 30 26 64 87 47 49 26 43 25

45 38 44 56 59 52 76 27 89 46

90 57 73 48 58 89 51 32 56 88

66 62 52 67 69 68 49 92 66 95

54 74 32 39 35 36 69 50 71 92

He also visited the library and found out that previous candidates used three books for their revision; Longhorn, Baroque or Math Clinic. From the Librarian’s records it is clear that those who did not use any books failed the subjects greatly. Out of the 50 candidates this year 13 used Longhorn, 20 used Baroque and 17 used Math Clinic. 9 used Longhorn and Math Clinic, 3 used Longhorn and Baroque while 8 used Baroque and Math Clinic only. The records show that 2 used all the three books.

He observed that he should replace one book type of the three with Fountain Publisher since no student read it only alone.

**Tasks**

1. (i) Help the headteacher group the marks to make an informed decision on the fate of the department and defend it.

(ii) Display the students’ marks in groups on a simple statistics diagram.

1. (i) Help the headteacher identify the book he should replace and explain why

 (ii) Find the probability that a student selected from the class failed.

**Part I1**

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

**Item 3**

A community is planning to construct a tower on top of a hill. The base of the hill is located at a distance of  meters from point A. The angle of elevation from point A to the top of the hill is 50°, and the angle of elevation from point A to the top of the tower is 60°. The community has set a safety requirement that the height of the tower should not exceed 50 meters for stability reasons.

The community seeks your help in calculating the height of the tower based on the given angles of elevation and the distance to the hill, and would like your advice on whether the tower can be constructed safely according to the stability requirement.

**TASK:**

Help advise the community whether the tower can be built safely according to the safety requirement.

**Item 4**

Joshua is tasked to take company goods from a factory to three trading Centers. The car is going to use has 20 liters and it uses 1 liter of fuel for every 15 km. He left the factory to the first trading Centre which is 70 km away on a bearing of N60𝑜E. He then move eastwards at an average speed of 60 km/hr. for 30 minutes to the second trading Centre. From this Centre he took a bearing of 200𝑜 and move a distance of 50 km to the third trading Centre.

At this centre he was shown a direct- route that would take him back to the factory but was not sure whether the remaining fuel in the car was enough for the journey since he did not know the distance.

**Task:**

1. Help Joshua to determine;
2. The distance of the direct-route from the third trading center to the factory.
3. Whether the remaining fuel in the car will be enough for journey using the direct- route.