456/1

MATHEMATICS

Nov/Dec 2023

2 Hours: 30 Mins

MEBU EXAMINATIONS BOARD

Uganda Certificate of Lower Secondary Education

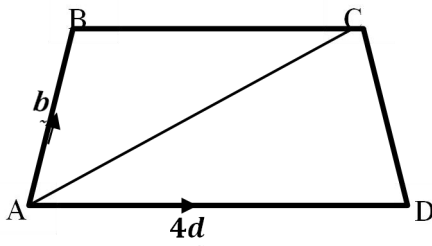### S.3 END OF YEAR ASSESSMENT 2023

MATHEMATICS

TIME: 2:30 MIN

<u>INSTRUCTIONS:</u>

*Answer **all** questions in Section A and only **three** from Section **B**.*

SECTION A

1. Tom, Amina and Willy contributed a certain amount of money to set up a business. Tom contributed 1/3, Amina contributed 1/4 and Willy contributed the rest.
a) Find the fraction contributed by willy
b) If Tom contributed UGX 200000, how much did they contribute all together?   (5 marks)

2. A boy sited on top of a ship looks at two fishermen in boats A and B in a straight line. If the angles between the horizontal and the boats A and B are 60 and 39 respectively. Find the distance of separation between the boats.   (5 marks)

3. Town A is 650km from Town B at a bearing of 120^0. Town B is 800km westwards of town C. If 1cm represents 50km draw an accurate diagram and hence find the shortest distance from town A to town C.
          (5 marks)

4. A straight line passes through the origin and the point (1, -1),
i)   Find the equation of the line.
ii) Determine the equation of the line that passes through (-7,1) and is parallel to the line formed above.
          (5 marks)

5. Daniella had a certain number of oranges. She ate seven oranges in the morning, she was given more oranges equal to those she had remained with. The number of oranges became 16.
a) Form an equation representing the information above.
b) How many oranges did she have at first?   (5 marks)

6. A cooking class wants to use up 8 cups of butter milk and 19 eggs by baking rolls and muffins to freeze. A batch of rolls uses 1 cups of butter milk and 2 eggs. A batch of muffins uses 3 cups of butter milk and 1 egg. Write down two equations to represent the above information and solve the simultaneous equations.   (5 marks)

7. Tyrone is a boat captain who sails on a quadrilateral lake ABCD in which BC is parallel to AD, where AD =$4\underset{\sim}{d}$, AB = $\underset{\sim}{b}$ and BC = 3/4 AD.

He wants to determine the speed of the boat in order to cross the river in the direct manner, help him find the distances of BC, AC and CD in terms of $\underset{\sim}{b}$ and $\underset{\sim}{d}$. (5 marks)

8. Nana a trader deals in general merchandise. She gives out 50% off on prices for those who pay cash. The price for soap is UGX 50,000 per box, the price for cooking oil is UGX 70,000 per 20 litre jerrycan. if Jane bought 1 box of soap and a 20 litre jerrycan of cooking oil and paid cash.

a) Calculate the discount paid by Jane on each item

b) If Wycliffe bought 10 litres of cooking oil and ½ box of soap. Calculate the discount paid on each item.

(5 marks)

SECTION B

9.Mbarara and Jinja are 360km apart. At 7:30 am a car left Jinja for Mbarara traveling at a steady speed of 80kmh^{-1}. At the same time a bus left Mbarara for Jinja at an average speed of 100kmh^{-1}

a) On the same axes show the journeys of the two vehicles. (Use a scale of 2cm to represent 50km and 2cm to represent 1 hour). (6 marks)

b) Use your graphs to find the:

(i).Time when the two vehicles met. (1 mark)

(ii).Distance from mbarara to where the two vehicles met. (1 mark)

(iii).Difference in the times of arrival of the two vehicles. (2 marks)

10.The table below shows ages of 60 university students, to the nearest years

Age (years)	17-19	20-22	23-25	26-28	29-31
Number of students	3	7	13	25	12

a) Calculate the students mean age. (3 marks)

b) i) Draw a cumulative frequency curve (Ogive) for the data. (5 marks)

ii Use the ogive to find the median age. (2 marks)

11.A cake is made up of the ingredients; flour, oil, eggs, and sugar. A sample of three cakes made by a certain bakery were found to have been from;

2kgs of flour, I litre of oil, 8grams of sugar, and 5 eggs

3kgs of flour, 2 litres of oil, 10 grams of sugar, and 8 eggs

5kgs of flour, 3 litres of oil, 15 grams of sugar, and 10 eggs

The cost of a kg of flour, a litre of oil, a kg of sugar and one egg were shs 4000, shs 8000, shs 5000 and shs 500 respectively.

a) Write down a 3× 4 matrix for the ingredient items of the cakes and a 4×1 matrix for the cost of each item. (4 marks)

b) Use matrix multiplication to calculate the total cost of making the three cakes. (6 marks)

12. The table below shows the tax structure on taxable income of a certain working class of people.

Income (sh) per month	Taxable
0-30000	10. 0
30001-90000	16.5
90001-190000	23.5
190001-340000	32
340001-500000	40.0
Above 500000	49.5

An employee earns sh 750000. His allowance includes;

Marriage allowance - on fifteenth of his gross monthly income

Water and electricity - sh 15000 per month

Relief and insurance - sh 180000 per annum

Housing allowance - sh 40000 per month

Medical - sh 300000 per annum

Transport allowance - sh 36000 per month

Family allowances for four children only; for children in the age bracket 0 - 10 years, shs 12500 per child, between 10 and 18 years, shs 8250 per child and over 18 years shs 5000 per child.

a) Calculate the man's taxable income and the income tax he pays, given that he has three children, two of whom are aged between 0 and 10 and the other child 13 years. (8 marks)

b) What percentage of his gross income goes to tax? (2 marks)

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