**456/1**

**MATHEMATICS**

**Paper 1**

**Uganda Certificate of Education**

MATHEMATICS

**Paper 1**

2 hours 30 minutes

**INSTRUCTIONS TO CANDIDATES:**

* *Answer* ***all*** *questions in Section* ***A*** *and* ***not*** *more than* ***five*** *from section* ***B****.*
* ***All*** *necessary calculations* ***must*** *be done in the same answer booklet provided.*
* *Mathematical tables, squared papers may be provided.*
* *Silent, non-programmable scientific calculators may be used.*
* *Any additional question(s) answered will* ***not*** *be marked.*

**Turn Over**

**SECTION A (40 MARKS)**

Attempt **all** questions in this section

1. Given that , evaluate (04 marks)

2. Simplify . (04 marks)

3. Solve for in (04 marks)

4. Given matrices Find matrix such that

(04 marks)

5. Given that , express in terms of and . (04 marks)

6. In triangle . Calculate the area of the triangle. (04 marks)

7. In the figure below O is the centre of the circle.

Find the value of and. (04 marks)

8. Musa buys 4 exercise books and 3 graph books and it cost him shs.250. If he buys 2 graph books and 1 exercise book at shs.100. Find the cost of 3 exercise books and 2 graph books. (04 marks)

9. A point P(-2, 3) is reflected in the line x + y = 0 to firm its image P'. State the coordinats of P'. (04 marks)

10. A bag contains 6 yellow and 8 blue identical balls. Two balls are picked at random from the bag, one at a time without replacement. Find the probability of picking a blue ball on the second picking. (04 marks)

**SECTION B (60 MARKS)**

*Answer any* ***five*** *questions*

11. The table below shows the masses (in kg) of 30 babies in the hospital.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Mass (kg) | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 |
| No. of babies | 2 | 2 | 10 | 8 | 2 | 5 | 1 |

1. State
2. Class interval
3. Modal class
4. Calculate the mean mass, using an assumed mean of 22kg.
5. Plot an O give for the masses and use it to estimate the median.

(12marks)

12. (a) Draw the graphs of and the line for values of from and .

(b) Use your graph to solve the equation (12 marks)

13. (a) Use an equilateral triangle, show that (04 marks)

(b) The angle of elevation of a point A from the top of a cliff (T) 100m high is . Another point B on a straight line as point A is 250m from T. calculate the distance between points A and B. (08 marks)

14. (a) If matrix . Find Where I is 2 x 2 identity matrix. (06 marks)

(b) Solve the simultaneous equation using matrix method

5x + 3y = 7

4y = 2x – 2 (06 marks)

15. A ship sails from Entebbe on bearing of 080° for 250km to Sesse Island. From there it heads for Luzira Port 450km away on a bearing of 215°.

1. By scale drawing, use a scale of 1cm to represent 50km to draw an accurate diagram showing the route of the ship.
2. From the diagram, determine the distance and bearing of Entebbe from Luzira Port.

1. If the ship is to sail back to Entebbe using a direct route and traveling at an average speed of Find the time it take for the journey.

(12 marks)

16. (a) A line TX with vertices T(4,2) and X(2,4) undergo a positive quarter turn rotation about (0,-1). Find the coordinates of T'X' the image of line TX.

(06 marks)

(b) Triangle PQR is mapped onto P'(1,2), Q'(1,3) and R'(3,5) by a matrix of transformation M= Describe matrix M and find the coordinated of triangle PQR. (06 marks)

17. John wishes to transport 60 tonnes of lake sand to a building site. He has 5 trucks which can each carry 5 tonnes and has 8 tippers which can each carry 1 tonne of lake sand. The tipper makes 5 trips per day and the truck makes 2 trips per day. He has 10 drivers available. The cost of a tipper is shs.40,000 per day and a truck is shs.100,000 per day. By letting x and y be the number of tippers and trucks used respectively,

1. Form the inequalities representing the above information.
2. Represent all the above inequalities on the same graph by shading of the unwanted region.
3. Find the number of tippers and trucks he has to use in order to minimize the total cost. (12 marks)

***END***