***456/1***

***MATHEMATICS***

**PAPER 1**

**Nov, 2020**

**2½ hrs**

**Uganda Certificate of Education**

**RESOURCEFUL MOCK EXAMINATIONS 2020**

**MATHEMATICS**

**PAPER 1**

**2 HOURS 30 MINUTES**

***INSTRUCTIONS TO CANDIDATES***

* *Answer* ***all*** *the questions in Section* ***A*** *and NOT more than* ***Five*** *from*

*Section* ***B.***

* *All necessary working* ***must*** *be shown clearly.*
* *Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used.*

**SECTION A:(40 MARKS)**

*Attempt* ***all*** *questions in this section*

1. Given that , evaluate (4marks)

2. Make R the subject of the equation; (4marks)

3. Use factorization method to solve the equation . (4marks)

4. Find the inverse of the matrix; . (4marks)

5. In the diagram below, O is the centre of the circle and TA is a tangent to the circle. ABCD is a cyclic quadrilateral and angle .

C

T

*d0*

O

D

590

*b0*

B

A

Find the values of the angles marked and . (4marks)

6. The table below shows the marks obtained by 40 students in a Chemistry Practical test.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Marks | 10 – 19 | 20 – 29 | 30 – 39 | 40 – 49 | 50 – 59 |
| Number of students (f) | 8 | 10 | 12 | 8 | 2 |

Calculate the mean mark. (4marks)

7. Solve the inequality; . (4marks)

8. A two digit number is written at random using the numerals 1, 3 and 4 without repeating any numeral.

a) Write down the possibility space.

b) Find the probability that the number written is a prime number. (4marks)

9. Find the coordinates of the images of the points and under the matrix of transformation. (4marks)

10. Given that and , find without using mathematical tables or a calculator the value of . (4marks)

**SECTION B (60MARKS)**

*Answer any* ***five*** *questions from this Section.*

11. a) Given that and , determine the values of

(5marks)

b) Two taxi-minibuses a Nissan and a Fuso transported students from Luzira to Kampala. when Nissan had made 3 journeys, the Fuso had made 2, and they had transported 107 students altogether. When the Nissan had made 2 journeys and the Fuso 4, they had transported 146 students altogether. If each journey made by each taxi-minibus was at full capacity, find the capacity of each taxi-minibus. (7marks)

12. The table below shows the heights in a class of 40 senior one students of a certain school.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Height | 140 – 144 | 145 – 149 | 150 – 154 | 155 – 159 | 160 – 164 | 165- 169 | 170 – 174 |
| Number of students (f) | 2 | 5 | 9 | 10 | 7 | 5 | 2 |

a) Use the table to calculate the;

i) Mean height

ii) Median height (8marks)

b) Draw a histogram for the data and use your histogram to estimate the modal height of the students. (4marks)

13. a) Copy and complete the table below for the function

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 |
|  | 16 | 9 | 4 | 1 | 0 | 1 | 4 | 9 | 16 |
|  |  |  |  |  |  |  |  |  |  |
| 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
|  |  |  |  |  |  |  |  |  |  |

(2marks)

b) Using a scale of 2cm to represent 1 unit on the horizontal axis and 1cm to represent 2 units on the vertical axis, draw the graph of for . (3marks)

c) Use your graph to solve the equation; . (2marks)

d) On the same axes, draw the graph of . (2marks)

e) Use your graphs to solve the equation . (3marks)

14. A ship leaves a port and sails for 140km on a bearing of 1250. It then changes direction to a bearing of 2500 and sails for 180km to an Island. Using a scale drawing with 1cm to represent 20km, find;

a) the distance of the Island from the Port. (8marks)

b) the bearing of the Island from the Port. (2marks)

c) how long it would take for the ship to sail directly back to the port at a speed of 20kmh-1. (2marks)

15. A triangle whose vertices are and undergoes a transformation represented by the matrix to be mapped on to triangle The image triangle further undergoes a transformation represented by to be mapped on to triangle

a) Find the coordinates of;

i) ii) (6marks)

b) Determine the single matrix of transformation which would map triangle back on the triangle . (6marks)

16. a) Given that matrix , and .

i) determine the order of P.

ii) find the matrix P (6marks)

b) Solve the following simultaneous equations using matrix method. (6marks)

17. a) By shading the unwanted regions, show on a graph the region satisfying the inequalities below;

i)

ii)

iii)

iv)

v) (8marks)

b) Use your graph to find the integral values of x and y, which give the minimum value for both (4marks)

**END**