NAME:_____**CLASS:**____

MZUZU DIOCESAN SCHOOLS

2021 MALAWI SCHOOL CERTIFICATE OF EDUCATION MOCK EXAMINATION

MATHEMATICS

Subject Number: M0131/1

Wednesday, 4th August **Time allowed: 2hours**

07:30 am-09:30am

PAPER 1

(100 marks)

Instructions

1. This paper contains **10 pages**. Please check.
2. Attempt all questions in this paper
3. The maximum number of marks for each answer is indicated against each question.
4. Write your name at the top each page of your question paper in the spaces provided.
5. Write your answers in the spaces provided on this paper
6. In the table provided on this page, tick against the question number you have answered.
7. All working must be clearly shown

Question number	Tick if answered	Do not write in these columns	
1			
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1. Factorise completely $1-(3-y)^2$ **(4 marks)**

2. Evaluate $3452_6 + 7634_8$, express the answer to answer 10 **(5 marks)**

3. The function $g(x) = 2^x + 1$, calculate the value of $g(4)$ **(3 marks)**

4. Make $\boldsymbol{y}$ the subject of the formula $\sqrt{y} = \frac{w+w(xy)^{\frac{1}{2}}}{x^{\frac{1}{2}}}$ **(5 marks)**

5. A diamond ring is priced at K 4000. If its value appreciates by 10% each year, what will be its value 3 years after purchase **(4 marks)**

6. **Figure 1** shows a circle BDC in which AB and AC are tangents to a circle at B and C respectively. Angle BAC = 80˚and angle ACD = 40˚

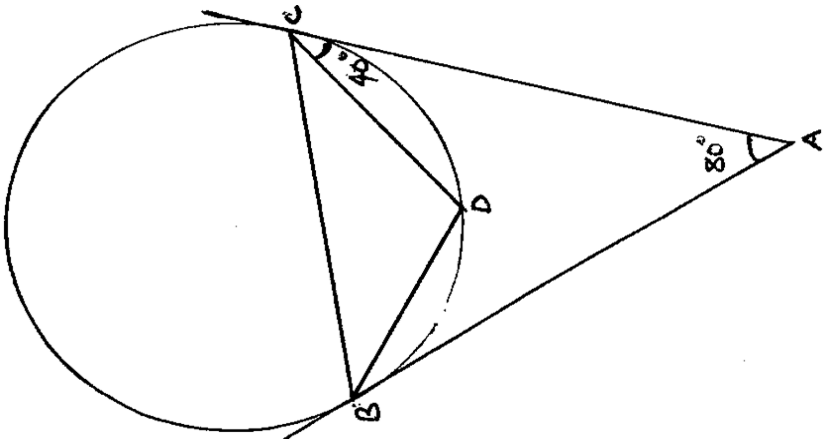

Figure 1

Calculate angle ABD **(5 marks)**

7. Simplify the following expression $\frac{m}{m+5} + \frac{5m+25}{m^2+10m+25}$

(5 marks)

8. Given that matrix $M = \begin{bmatrix} 2 & 2 \\ -1 & -1 \end{bmatrix}$ and $M^2 = \boldsymbol{\lambda} M$ where λ is a constant , calculate the value of $\boldsymbol{\lambda}$ **(5 marks)**

9. The fourth term of a GP is 7 and the common ratio is 3, find the seventh term **(4 marks)**

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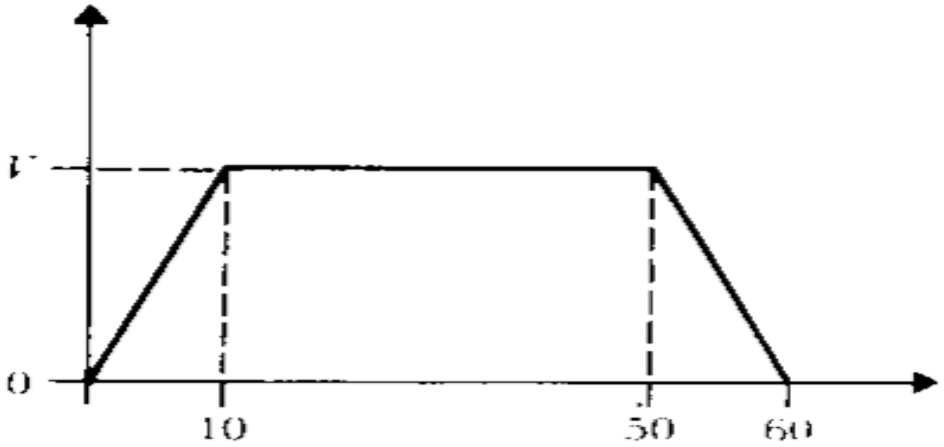
10. Simplify the following surd $\frac{\sqrt{n^3}-\sqrt{n}}{n^2-1}$ **(4 marks)**

11. In winter the probability that it rains in any one day is $5/7$, using a tree diagram calculate the probability that it will rain on the first day but not on the second day. **(6 marks)**

12.Figure 2 shows a speed - time graph of a motorist.



If total distance covered is 630m in the first 50seconds. Calculate the value of the maximum speed V **(5 marks)**

13. P varies directly as a cube of n and inversely as a square root of t.

If $p = 16$ when $n = 2$ and $t = 9$, find the value of p when $n = {}^{1}/_{2}$ and $t = 4$ **(5 marks)**

14. Solve the equation $\log_5 x = 1 - \log_5(x - 4)$ **(6 marks)**

15. **Figure 3** below shows a circle ADCE centre O. OB is perpendicular to chord DE and AC is a dimeter such that OB = 8cm and BC = 2 cm.

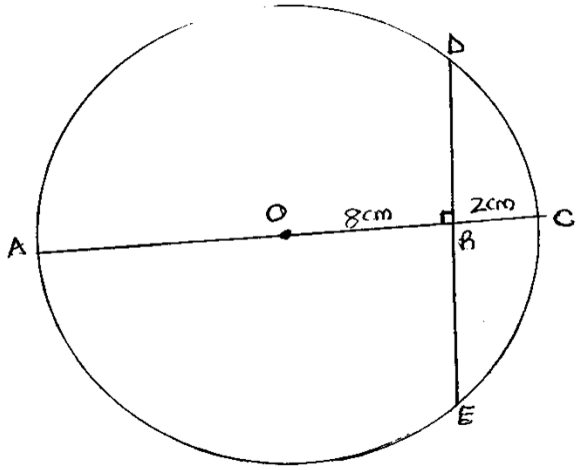


Figure 3

Find the length of line DE **(5 marks)**

16. A triangle PQR has vertices P(2,5), Q (-1, 4) and R (2, -1). If the triangle PQR is translated 5 units to the left and 6 units up. Find the coordinates of the image of the triangle PQR. **(6 marks)**

17. On the same axes using a graph provided show the region defined by the following inequalities by shading unwanted region.

$$y \geq 0$$

$$y \geq -\frac{1}{2}x + 1$$

$$y \leq x + 1$$

$$y < -\frac{4}{5}x + 4$$

(6 marks)

18. In a survey, 100 people were asked which they preferred tea or coffee. 15 said they liked neither, 25 said they liked both and 40 said they liked tea but not coffee. How many people liked coffee only **(6 marks)**

19. When a polynomial $x^3 + \boldsymbol{p}x - 4$ is divided by $x + 4$ the remainder is -28. Find the value of $\boldsymbol{p}$ **(5 marks)**

20. Using a pair of compasses and a ruler only, construct in the same diagram:

i. Triangle ABC in which AB = 6cm, BC= 8 cm and angle ABC = 60˚

ii. construct a circumscribed circle of the triangle ABC

iii. measure and state the radius of the circle **(6 marks)**

END OF QUESTION PAPER

Nb: This paper contains 14 pages