**NAME …………………………………………………… INDEX NO. ………………………..**

**SCHOOL ……………………………………………………DATE ………………………..**

**SIGN: ……………………………………………………….**

**TRIAL 1 EVALUATION TEST**

**121/1**

**MATHEMATICS**

**PAPER 1**

**TIME: 2 ½ HOURS.**

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**INSTRUCTIONS TO CANDIDATES**.

1. Write your name, school and Index No. in the spaces provided at the top of this paper.
2. Write the date of examination in the spaces provided above.
3. This paper contains TWO sections: section I and section II
4. Answer all the questions in section I and any FIVE questions from section II.
5. All answers and working must be written on the question paper in the spaces provided below each question.
6. Show all the steps in your calculations, giving your answers at each stage in the spaces provided below each questions.
7. Marks may be given for correct working even if the answer is wrong.
8. Non-programmable silent electronic calculators and KNEC mathematical tables may be used except where stated otherwise.

**SECTION I – 50 MKS**

**Answer all the questions in this section in the spaces provided.**

1. Without using a calculator, evaluate (3mks)

$\frac{1}{2}$ of 3$\frac{1}{2}$ + 1$\frac{1}{2}$ (2$\frac{1}{2}$ - $\frac{2}{3}$)

 $\frac{3}{4}$ of 2$\frac{1}{2}$ ÷ $\frac{1}{2}$

1. John spent ¼ of his September salary on rent, $\frac{1}{3}$ of the remainder on food and $\frac{1}{10}$ of what was left on other bills. If he still had sh. 4500, what was his salary in September? (3mks)
2. A bus leaves town A at 8.30 a.m and travels at an average speed of 70 km/hr. Thirty minutes later, a car leaves the same town and follows the bus at 120 km/h. Find how far apart they will be at 9.30 a.m. (3mks)
3. Five shirts and four pairs of trousers cost a total of shs. 6160. Three similar shirts and a pair of trousers cost sh. 2800. Find the cost of four shirts and a pair of trousers. (3mks)
4. The sum of interior angles of a regular polygon is 1080o
5. Find the size of each exterior angle. (2mks)
6. Name the polygon (1mk)
7. Wanjiru, Atieno and Jeptoo shared the profit of their business in the ratio 3:7:9 respectively. If Atieno received shs. 60,000, find how much profit the business realised. (3mks)
8. A two-digit number is such that the sum of the ones and tens digit is ten. If the digits are reversed the new number formed exceeds the original number by 54. Find the number. (3mks)
9. The scale of a map is given as 1:20,000. Find the actual area in hectares of a region represented by a triangle of sides 6cm, 7 cm and 4 cm. (4mks)
10. Use reciprocal tables to find the value of $\frac{1}{0.325}$ hence evaluate $\frac{\sqrt{0.000125}}{0.325}$ (4mks)
11. Solve 9(x+1) = 243 (3mks)
12. Find the integral values of x for which 5 ≤ 3 x + 2 < 14 (3mks)
13. A Kenyan company received US Dollars M. The money was converted into Kenyan shillings in a bank which buys and sells foreign currencies.

***Buying (Kshs.) Selling (Kshs)***

 1 sterling Pound 125.78 126.64

 1 US Dollar 75.66 75.86

1. If the company received Kshs. 15,132,000, calculate the amount M received in US Dollar. (2mks)
2. The company exchanged the above Kenya shillings into sterling Pounds to buy a car in Britain. Calculate the cost of the car to the nearest Sterling Pound. (2mks)
3. In the circle below, A, B, C and D are points on its circumference. Chord BC = AC and angle ADC = 138o.

 B

 A

 13

 D C

Giving reasons calculate the angle ACB (3mks)

1. Simplify: (3mks)

 12x2 – 16x

20 – 11x – 3x2

1. Evaluate without using tables

Log(3x + 8) – 3 log 2 = log (x – 4) (3mks)

1. Given that OP = 2i + 5j and OQ = 3i – 2j find the magnitude of PQ to one decimal place. (3mks)

**SECTION II (50 MKS)**

**Answer any five questions from this section in the spaces provided.**

1. Two vertices of a triangle ABC are A(4,7) and B(6,11)
2. Find the equation of line AB. (3mks)
3. Find the equation of the perpendicular bisector of line AB (4mks)
4. Given that AC is perpendicular to AB and the equation of line BC is y = -5x + 45, find the co-ordinates of C (3mks)
5. An institution intended to buy a certain number of chairs for Kshs. 27,000. The supplier agreed to offer a discount of Kshs. 60 per chair which enabled the institution to get 5 more chairs. Taking x as the original intended number of chairs,
6. Write an expression in terms of x for
7. Original price per chair (1mk)
8. Prince per chair after discount. (1mk)
9. Determine:
10. The number of chairs the institution originally intended to buy. (4mks)
11. Price per chair after discount. (2mks)
12. The amount of money the institution would have saved per chair if it bought the intended number of chairs at a discount of 20% (2mks)
13. The figure below represents a quadrilateral piece of land ABCD divided into three triangular plots. The lengths BE and CD are 100 m and 80 m respectively. Angle ABE = 30o, <ACE = 45o and <ACD = 100o.

 A D

 80 m

 100o

 30o 45o

B E C

 100 m

1. Find to four significant figures
2. The length of AE (2mks)

ii) The length of AD (3mks)

iii) the perimeter of the piece of land. (3mks)

1. The plots are to be fenced with five strands of barbed wire leaving an entrance of 2.8 m wide to each plot. The type of barbed wire to be used is sold in rolls of length 480 m. Calculate the number of rolls of barbed wire that must be bought to complete the fencing of the plots. (2mks)
2. A block T is made up of a cylindrical part and a conical part. The height of the block is 6.5 m. The common radius of the cylindrical part and the conical part is 1.9 m. The height of the conical part is 2.5 m.
3. Calculate the volume, correct to 2 decimal places of block T (4mks)
4. Calculate the total surface area of block T (4mks)
5. A square base pillar of side 2.6 m has the same volume as block T. Determine the height of the pillar, correct to 1 decimal place. (2mks)
6. The marks of students in a certain class were recorded as follows:

48 62 56 58 70 69 72 83 59 64

59 51 67 68 79 82 70 68 52 51

89 72 68 77 64 70 75 71 58 57

79 69 80 62 73 68 69 59 61 54

77 59 61 68 64 69 49 69 64 62

1. Ending with the highest mark and using a class interval of five make a frequency distribution table for the data. (2mks)
2. Calculate:
3. The mean mass (3mks)
4. The median mass (3mks)
5. Draw a histogram to represent the data. (2mks)
6. Using a pair of compasses and a ruler only, construct
7. (i) triangle ABC in which AB = 4.5 cm, <BAC = 30o and <ABC = 112.5o (3mks)

(ii) A circle that passes through the vertices of the triangle ABC. Measure the radius. (3mks)

1. The height of triangle ABC with AB as the base. Measure the height. (2mks)
2. Determine the area of the circle that lies outside the triangle correct to 2 decimal places. (2mks)
3. The corner points A, B, C and D of a ranch are such that B is 9 km directly East of A and C is 6.5 km from B on a bearing of 30o. D is 7 km from C on a bearing of 300o.
4. Using a scale of 1 cm to represent 1 km, draw a diagram to show the positions of A, B, C and D (4mks)
5. Use the scale drawing to determine
6. The bearing of A from D (1mk)

ii) The distance BD in kilometers. (2mks)

iii) the perimeter of the ranch in kilometers. (3mks)

1. The vertices of triangle PQR are P(0,0) Q(6,0) and R(2,4)
2. Draw triangle PQR on the grid provided. (1mk)
3. Triangle P’Q’R’ is the image of triangle PQR under an enlargement scale factor ½ and centre (2,2). Write down the co-ordinates of triangle P’Q’R’ and plot on the same grid. (2mks)
4. Draw triangle P”Q”R” the image of triangle P’Q’R’ under a positive quarter turn about point (1,1) (3mks)
5. Draw triangle P’”Q”’R’” the image of triangle P”Q”R” under reflection in the line y = 1 (2mks)
6. Describe fully a single transformation that maps triangle P”’Q”’R”’ onto triangle P’Q’R’ (2mks)