KING CYRUS SECONDARY SCHOOL

DEPARTMENT OF MATHEMATICS

END OF TERM THREE EXAMINATIONS

MATHEMATICS
PAPER 1
$2\frac{1}{2}$ HOURS

FORM THREE 2025
121/1
MATHEMATICS
PAPER1

INSTRUCTIONS TO CANDIDATES

1. *Write your name and index number in the spaces provided at the top of this page.*
2. *This paper consists of two sections:* ***Section I and Section II.***
3. *Answer* ***all*** *questions in* ***section I*** *and* ***any five questions*** *from* ***Section II.***
4. *Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.*
5. *Marks may be given for correct working even if the answer is wrong.*

Non- programmable silent electronic calculators **and KNEC** Mathematical tables may be used

NAME……...

ADM NO……

SCHOOL…….....

DATE……...

FOR EXAMINER'S USE ONLY

SECTION I

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total

SECTION II

17	18	19	20	21	22	23	24	Total

GRAND TOTAL

This paper consists of 13 pages. Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.

SECTION A (50 MARKS)
Attempt all the questions

1. Without using mathematical tables or calculators, evaluate the following leaving your answer as a fraction in its simplest form. (3mks)

$$3\sqrt{\frac{0.119\times 0.256}{0.068\times 7}}$$

2. Two boys and a girl shared some money .The elder boy got $\frac{4}{9}$ of it, the younger boy got $\frac{2}{5}$ of the remainder and the girl got the rest. Find the percentage share of the younger boy to the girl's share. (4mks)

3. Solve for t in the equation

$9^{t+1}+3^{2t}=30$ (3mks)

4. The exterior angle of a regular polygon is $(\chi - 50)°$ and the interior angle is $(2\chi + 20)°$. Find the number of sides of the polygon. (3 mks)

5. A salesman is paid a salary of Sh. 10,000 per month. He is also paid a commission on sales above Sh. 100,000. In one month he sold goods worth Sh. 500,000. If his total earning that month was Sh. 56,000. Calculate the rate of commission. (3 mks)

6. In a book store, books packed in cartons are arranged in rows such that there are 50 cartons in the first row, 48 cartons in the next row, 46 in the next and so on.

(a) How many cartons will there be in the 8^{th} row? (2 mks)

(b) If there are 20 rows in total, find the total number of cartons in the book store (2 mks)

7. A rectangle whose area is $96m^2$ is such that its length is 4metres longer than its width. Find:

(a) It dimensions (2 mks)

(b) Its perimeter (1 mk)

8. (a) Find the gradient of a straight line joining the points P(2,3) and Q(8,-6) (1mk)

b) Hence find the equation of the line through P perpendicular to line PQ. [3mks]

9. Simplify by rationalizing the denominator (3mks)

$$\frac{3}{2\sqrt{3}-\sqrt{2}}$$

10. I f (5x+6y): 2x+10y = 22:10, find x:y. (2mks)

11. Given that $25x^2 - 20x + k$ is a perfect square. Find the value of k. (3 mks)

12. Evaluate $\dfrac{\frac{1}{2}of\,3\frac{1}{2}+1\frac{1}{2}\left(2\frac{1}{2}-\frac{2}{3}\right)}{\frac{3}{4}of\,2\frac{1}{2}\div\frac{1}{2}}$ (3mks)

13. Omwando borrows sh. 90,000 for 5 years at 6 ½ % simple interest p.a. What amount does he have to pay at the end of that time? (3mks)

14. Given that log a = 0.30 and log b = 0.48 find the value of $\log \frac{b^2}{a}$. (3mks)

15. Find the value of x in the equation.
    $\cos(3x - 180^0) = \frac{\sqrt{3}}{2}$ For the range $0 \leq x \leq 180^0$ (3 mks)

16. Given that the dimensions of a rectangle are 20.0cm and 25.0. Find the percentage error in calculating the area. (3 marks)

SECTION B (50 MARKS): Attempt 5 questions only

17 Water flows through a circular pipe of cross-sectional area of $6.16cm^2$ at a uniform speed of 10cm per second. At 6.00 a.m. water starts flowing through the pipe into an empty tank of base area are $3m^2$.

a) What will be the depth of the water at 8.30 a.m.? (5 marks)

b) If the tank is 1.2m high and a hole at the bottom through which water leaks at a rate of $11.6cm^3$ per second. Determine the time at which the tank will be filled. (5 marks)

18 Using a ruler and a pair of compass only, construct a triangle ABC such that AB = 8cm, BC = 6cm and $<ABC = 30^0$ (2mks)

a) Measure the length AC (1mk)

b) Construct a circle that touches sides AB, BC and AC (2mks)

c) Measure the radius of the circle. (1mk)

d) Hence or otherwise calculate the area of the triangle not in the circle. (4mks)

19 A field was surveyed and its measurements recorded in a field book as shown below.

	F	
	100	
E 40	80	
	60	D 50
C 40	40	
	20	B 30
	A	

(a)Using a scale of 1cm to represent 10m, draw a map of the field. (4mks)

(b) Calculate the area of the field.

(i) In square metres. (4mks)

(ii) In hectares. (2mks)

20. The table below shows the income tax rates in a certain year.

Total income in k£per annum	Rate in shs per pound
1-3900	2
3901-7800	3
7801-11,700	4
11701-15600	5
15601-19500	7
Over 19500	7.5

Mrs.Masau earned a basic salary of ksh18600 per month and allowances amounting to ksh 7800 per month. She claimed a personal relief of ksh 1080 per month.

Calculate:

a) Total taxable income in k£ p.a (2 marks)

b) i) the tax payable in ksh per month without relief (4marks)

ii)the tax payable in ksh per month after relief (2marks)

c) Mrs. Musau's net monthly income (2marks)

21. The first term of arithmetic progression (A.P) is a and the common difference d. the 7^{th} term of the A.P is 11. The sum of the first 12 consecutive terms of the A.P is 123.

(a) (i) Form two simplified equations involving a and d to represent the information (2mks)

(ii) Find the values of a and d. (3mks)

(a) The 1st, 3rd and 8th terms of the A.P from the first 3 consecutive terms of a geometric progression (G.P). Calculate;

(i) The 6th term of the G.P. (3mks)

(ii) The sum of the first 6 terms of the G.P. (2mks)

22 Three towns P, Q and R are such that P is on a bearing of 120^0 and 20 km from Q, town R is on a bearing of 220^0 and 12km from P.

(a) Using a scale of 1cm to represent 2km draw and locate the position of the three towns (3 mks)

(b) Measure

i. The distances between Q and R in kilometres (2mks)

ii. The bearing of P from R (1mk)

iii. The bearing of R from Q (2mks)

(c) Calculate the area of the figure bounded by PQR (2mks)

23. The following table shows the distribution of marks obtained by 50 students.

Marks	**45-49**	**50-54**	**55-59**	**60-64**	**65-69**	**70-74**	**75-79**
No. of students	**3**	**15**	**13**	**9**	**4**	**1**	**5**

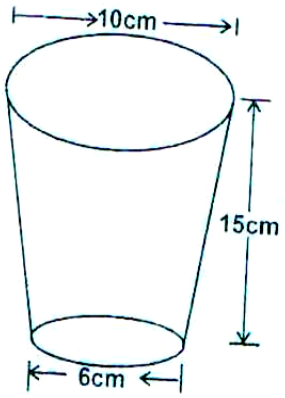
(a) By using an assumed mean of 60, calculate:

(i) The mean mark (4mks)

(b) The variance (4mks)

(c) The standard deviation. (2mks)

24 The figure below shows a tumbler with diameters 6cm and 10cm and height 15cm.



(a) If it is filled with water, what area is in contact with water? (7 mks)

b) Find the volume of the tumbler. (3 mks)