FORM 2
MATHEMATICS
END TERM EXAM – MARCH 2016
TIME: 2 ½ HOURS

NAME:…….…………………………………………... ADM. NO: ………DATE: ………

INSTRUCTIONS TO CANDIDATES:

- *Write your **name** and **Adm No** in the spaces provided above.*
- *This paper contains **two** sections: **Section I and Section II.***
- *Answer **all** the questions.*
- *All working and answers **must** be written on the question paper in the spaces provided below each question.*
- *Show all the steps in your calculations, giving your answers at each stage in the spaces provided below each question.*
- *Marks may be given for correct working even if the answer is wrong.*
- *KNEC mathematical tables may be used*

For Examiners' Use Only.

Section I

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

Section II

Questions	17	18	19	20	21	**Total**
Marks						

GRAND TOTAL	

1.Evaluate: (3 mks)

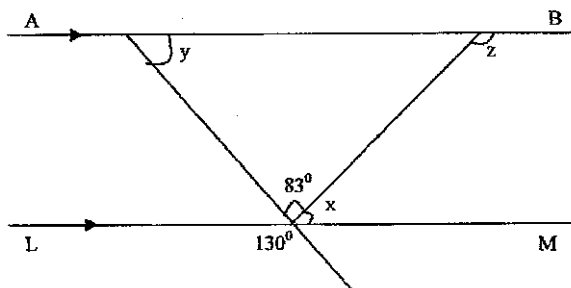$$\; \tfrac{3}{8} \; of \left\{ 7\tfrac{3}{5} - \tfrac{1}{3}\left(1\tfrac{1}{4} + 3\tfrac{1}{3} \right) \times 2\tfrac{2}{5} \right\}$$

1. Convert the recurring decimal $12.\dot{1}\dot{8}$ Into fraction (3 mks)

2. The exterior angle of a regular polygon is equal to one-third of the interior angle. Calculate the number of sides of the polygon and give its name. (4 mks)

3. In the figure below, lines AB and LM are parallel.

Find the values of the angles marked x, y and z. (3 mks)

5. 5 goats and 2 sheep cost sh 5400 while 3 goats and 4 sheep cost sh 5200. Find the cost of each goat and each sheep. (3 mks)

6. A perpendicular is drawn from a point (4,6) to the line $5y + 4x = 20$. Find its equation in the form $ay + bx = c$ where a, b and c are integers. (4 mks)

7. A two digit number is such that when the digits are reversed, the value of the number increases by 36. If the sum of the unit digit and twice the tens digit is 16, find the number. (3 mks)

8. Evaluate using reciprocals, square and square root tables only. (3 mks)

$$\sqrt{\frac{(445.1 \times 10^{-1})^2 + 1}{0.07245}}$$

9. Given that cos x = sin (3x – 30);
   (a) find x (2 mks)

   (b) Find without using tables: (2 mks)

10. Evaluate $\dfrac{592.4 \, Cos \, 43}{Sin \, 65}$ (3 mks)

11. The sum of two numbers exceeds their product by one. Their difference is equal to their product less five. Find the two numbers. (3 mks)

12. Solve for x in the given equation. (3 mks)

$$64^x - 121 = 7 - 4^{3x}$$

13. Show that 3126 is exactly divisible by 6 (3 mks)

14. A number n is such that when it divided by 27, 30 or 45, the reminder is always 3. Find the smallest value of n. (2 mks)

15. The actual area of an estate is 3510 hectares. the estate is represented by a rectangle measuring 2.6 cm by 1.5 cm on the map whose scale is 1:n. Find the value of n. (3 mks)

16. If X and Y are complementary angles and Cos $Y = \frac{4}{5}$, find sin X. (3 mks)

SECTION II

17. Two towns A and B are 30 km apart, B being due east of A. Town C is so situated that its bearing from A is 150^0 while from B it is 240^0.
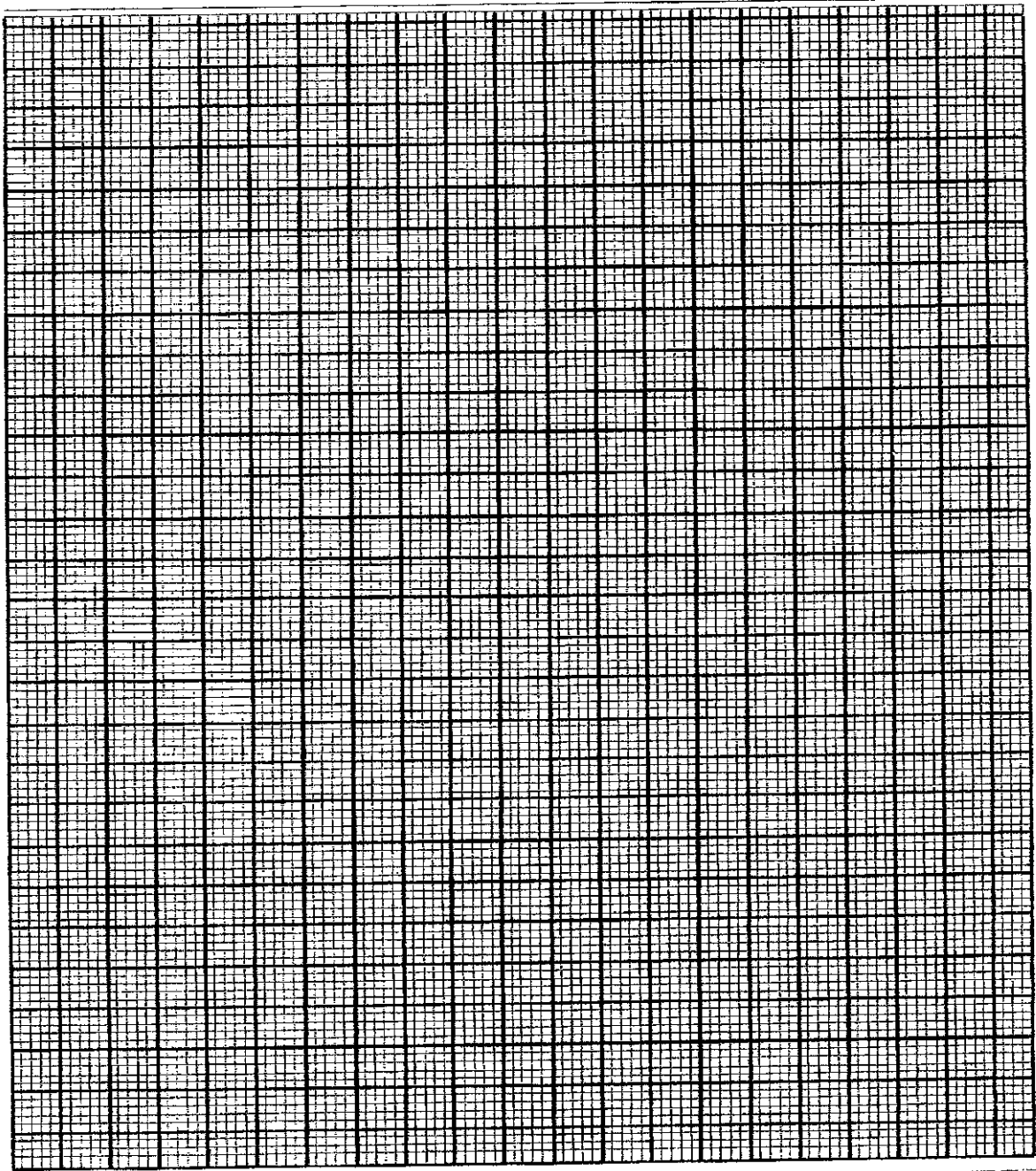   (a) Using scale drawing show the position of the three towns.   (7 mks)

    (b) Find the distance of C from both A and B.   (3 mks)

18. Triangle PQR has vertices P (3,2) Q (-1,1) and R (-3,01).
    (a) Draw PQR on the grid provided.   (1 mk)

(b) Under a rotation the vertices of $P^1Q^1R^1$ are P^1 (1,4), Q^1 (2,0) and R^1(4,-1). Find the centre and angle of rotation using points P and Q. (4 mks)

(c) Triangle PQR is enlarged with scale factor 3 centre O (0,0) to give triangle $P^2Q^2R^2$. Draw triangle $P^1Q^1R^1$ and state its co-ordinates. (2 mks)

(d) Triangle $P^2Q^2R^2$ undergoes reflection in line $y = -x$ to give triangle $P^3Q^3R^3$. Draw $P^3Q^3R^3$ and state its coordinates. (3 mks)

19. (a) The ratio of the base areas of two cones is 9:16
    (i)   Find the ratio of their volumes   (3 mks)

    (ii)   If the larger cone has a volume of 125cm^3, find the volume of the smaller cone.
                                                          (3 mks)

(b) Given that $35^{x-2y} = 243$ and $3^{2x-y} = 3$.   (4 mks)

20. From points A and B on a level ground the angles of elevation to the top of the building are 24^0 and 38^0 respectively. If the distance between A and B is 47m and that of B from the foot of the building is X;

(a) Form the expression for the height of the building (3 mks)

(b) Calculate the height of the building (4 mks)

(c) Find the difference in the distance between the top of the building and points A and B. (3 mks)

21. A surveyor recorded the following information in his field book after taking measurements in metres of a plot. the baseline is the straight line AH = 300m.

	H	
	250	100 to G
40 to F		
120 to D	200	
	180	80 to C
	100	60 to B
	A	

(a) Using a scale of 1cm to represent 20m, draw an accurate diagram of the plot.(5 mks)

(b) Use your diagram to calculate the actual area of the field in hectare.   (5 mks)