NAME: ………………………………….   INDEX NO: ………………………………

SCHOOL: …………………………………..   DATE : …………………………………

CANDIDATE'S SIGNATURE: …………………

121/2
MATHEMATICS
PAPER 2
JULY / AUGUST 2018
TIME: 2½ HOURS

FORM 4 MID-YEAR EVALUATION EXAMINATION 2018

Kenya Certificate of Secondary Education (KCSE)
MATHEMATICS
PAPER 2
TIME: 2½ HOURS

INSTRUCTIONS TO CANDIDATES

a) Write your **Name, Index Number** and **School** in the spaces provided at the top of this page.
b) **Sign** and write the **date** of examination in the spaces provided above.
c) This paper contains **TWO** sections: section I and section II
d) Answer **all** the questions in I and any FIVE questions from section II.
e) **All** answers and working must be written on the question paper in the spaces provided below each question.
f) Show **all** the steps in your calculations, giving your answers at each stage in the spaces provided below each question.
g) Marks may be given for **correct** working even if the answer is wrong.
h) Non-programmable silent electronic calculators and KNEC mathematical tables may be used except where stated otherwise.

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

SECTION 1: (50 MARKS)

**Answer ALL Questions in this section**

1. Using logarithms, evaluate $\hspace{3cm}$ (4mks)

$$\sqrt[3]{\frac{4.684 \log 314.2}{\tan 87^0}}$$

2. Simplify by rationalizing the denominator in $\frac{4-\sqrt{2}}{3+\sqrt{2}}$ leaving your answer an the form $a+b\sqrt{c}$ where a,b and c are integers. $\hspace{2cm}$ (3mks)

3. Make s the subject of the formulae in the following; $sa = \sqrt{\frac{s^2+q}{t^2}}$ $\hspace{2cm}$ (3mks)

4. Find the radius and centre of the circle whose equation is $2x^2 + 2y^2 - 6x + 10y + 9 = 0$. (4mks)

5. Draw a line AB=4cm, P is a variable point in the plane of the paper, above AB, such that angle $ABC = 60^0$ and the area of triangle APB= $6cm^2$. Using a ruler and a pair of compasses only find the locus of P.

(3 mks)

6. The sum of Shs. 50,000 is invested in a financial institution that gives 12%p.a. The interest is compounded quarterly. Find the total investment after 3 years. (3mks)

7. Given that $\begin{pmatrix} p & 3 \\ 2 & 2p-4 \end{pmatrix}$ is a singular matrix, determine the values of P (3 mks)

8. Expand and simplify the binomial $\left(2 + \dfrac{3}{x}\right)^5$. Hence use the first four terms of your expansion to find the value of $(2.5)^5$ (3mks)

9. Solve for x in the equation $2 \log x + \log 5 = 1 + 2 \log 6$ (3 mks)

10. A quantity h varies directly as a quantity v and inversely as the square–root of a quantity r. Find the percentage change in h when v is doubled and r increase by 21% (3 mks)

11. The probabilities of Nyakundi, Onyango and kamau going to school on Monday are 6/7 , 7/8 , and 8/9 respectively. Find the probability that at least one of them will go to school on Monday. (3marks)

12. An aeroplane leaves an airport A(10°S, 83°E) and flies due north at 700km/h to airport B. Find its position after 3 hours (Take $\pi = \dfrac{22}{7}$ and radius of the earth as 6370km (3 marks)

13. Find the equation of the curve whose gradient is given as 2x + 4, and passes through the point (2,3). (3mks)

14. In what ratio must "Murang'a" coffee costing sh. 25 per 100g be mixed with "Kisii" coffee costing sh. 17.50 per 100g, so that by selling the mixture at sh. 25 per 100g, a profit of 25% is made? (3mks)

15. The figure below shows a circle of diameter XY. Chord TZ intersects XY at C. A tangent to the circle at Y meets TZ produced at S.
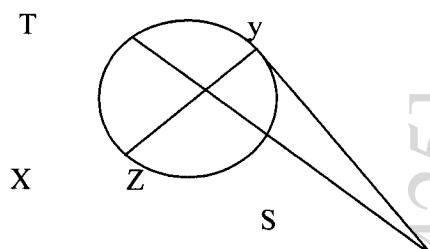
Given that TC = 14 cm, CY = 4 cm and YS = 7.5 cm. calculate the length of :

a) C S   (1 mk)

b) X C   (2 mks)

16. Solve for x in the equation $\sqrt{3}$ tan (x - 20)° = -1, for 0° $\leq$ x $\leq$ 360°   (3 mks)