NAME.....CLASS.....C/NO.....INDEXNO.....

NYABURURU GIRLS' NATIONAL SCHOOL
OUR LADY OF LOURDES

REVISED.....

DATE DONE.....

INVIGILATOR.....

DATE RETURNED.....

121/1

MATHEMATICS

PAPER 1

FEBUARY SERIES 2016

TIME: 2½ HOURS

Kenya Certificate of Secondary Education

February Series examination 2016

INSTRUCTIONS TO CANDIDATES:

1. *Write your name, and class in the spaces provided above.*
2. *Sign and Write the date of examination in the spaces provided above.*
3. *This paper consists of 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.*
7. *Non-programmable silent electronic calculators and **KNEC** Mathematical tables may be used unless stated otherwise*

FOR EXAMINER'S USE ONLY:

SECTION

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 I(50MKS)

1.)Evaluate $\dfrac{\frac{2}{3}of\left(\frac{3}{4}-\frac{1}{2}\right)+\frac{5}{6}}{\frac{4}{5}\times\frac{3}{8}\left(\frac{4}{9}+\frac{2}{3}\right)}$ (3mks)

2. A line passing through points P (4, a) and Q (3, 2) is perpendicular to the line $3y + x + 3 = 0$. Find the value of a and write down equation of line PQ. (4 marks)

3. The surface area of two cylindrical water tanks are $50m^2$ and $162m^2$ respectively. Given that the volume of water in the second tank is $36450m^3$, find the volume of water in the first tank if it's half full. (4 marks)

4. Simplify; $\frac{8-12x}{6x^2-7x+2} - \frac{4x-7}{3-6x}$ (3 marks)

5. Using tables of reciprocals, find the value of M if;

$\frac{1}{M} = \frac{3}{\sqrt{0.0272}} - \frac{5}{47.06}$ (3marks)

6. During a certain period the exchange rates at a Pesa point were;

	Buying shs	Selling shs
Riyal	19.68	19.78

A tourist arrived with 5480 Riyal which he changed to Kshs. He spend $\frac{2}{3}$ of the total in visiting various sites. As he was leaving he changed all he had to Riyal. Find how much Riyal did he receive, give your answer to 1 d.p. (3 marks)

7. A train moving 20m/s takes 15 seconds to completely cross a bridge which is 30 metres long. Find the length of train in metres. (3 marks)

8. Given that $\tan y^{o} = 0.75$ and y is acute angle; Find the value of

   $\sin y^{o} - \tan (90 - y)^{o}$ (2 marks)

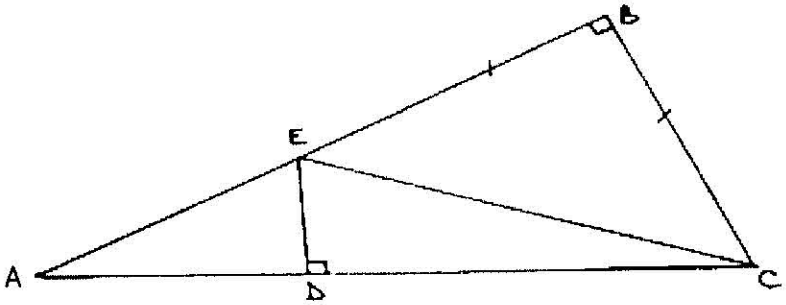
9. The exterior angle of a regular polygon is equal to one third of the interior angle. Calculate the sum of interior angles of the polygon. (3mks)

10. A man walks directly from point A towards the foot of a tall building 240m away. After covering 180m he observed that the angle of elevation of the top of the building is 45°. Calculate the angle of depression of point A from the top of the building. (3mks)

11. A book seller distribute cartons of books as follows, one school received 1/3 of the cartons he had in the stock. A second school received a quarter of the remainder. A third school received a third of what the second school received. What remained was 42 cartons. Find how many cartons the second school received. (3marks)

12. Find the value of x in the following equation (3mks)
$36^{x+1} + 6^{2x} = 222$

13. In triangle ABC below, angle ABC = 90°, angle ACB = 60°, angle ADE = 90°, AB = 4cm and BC=BE.



Calculate:

(a) BC. (1 mark)

(b) CE. (1 mark)

(c) DC. (1 mark)

14. Given $\mathbf{P} = (n-3)\mathbf{i} + (2n-4)\mathbf{j} + (2n-5)\mathbf{k}$ and $|\mathbf{P}| = 7$. Find the possible values of n. (4 marks)

15. A solid cone with a vertical height of 6cm and base radius 3cm is melted and recast into 8 identical hemispheres. Find the total surface area of such 7 hemispheres.
$\left(\text{take } \boldsymbol{\pi} = \frac{22}{7}\right)$ (4 marks)

16. Solve the following inequalities $\mathbf{3^{x-2} < 27^{x} \leq 81^{\left(\frac{1}{2}x + 2\right)}}$ and represent the solutions on a single number line. (3 marks)

SECTION II (50Mks)

17. Three businessmen Mwanzia, Godana and Macharia decided to buy a bus. The marked price of the bus was shs. 7,200,000. The dealers agreed that the three men could pay a deposit of 40% of the money and the rest to be paid within one year. Mwanzia, Godana and Macharia raised the deposit in the ratio 2: 3: 4 respectively. The balance plus 10% interest on the outstanding amount was to be paid to the dealer from the proceeds from the bus operations in the same ratio as the deposits. The three men shared the proceeds from the bus in the ratio as the deposits. The businessmen agreed to jointly save 15% of the proceeds for maintenance. During the year the bus realized shs. 8,044,000.

a) Find how much of the deposit Godana contributed (3 marks)

b) Find how much of the remaining amount Macharia paid at the end of the year.

(4marks)

c) After paying the remaining amount at the end of the year, how much money was Mwanzia left with? (3 marks)

18. Two towns P and Q are 580km apart. A bus left town P at 6.10a.m. and maintains an average speed of 90km/hr between P and Q. A car starts from Q at 8.00a.m. and travelled towards P at an average speed of 120km/hr. The car stopped for a total of 20 minutes on the way before meeting the bus.

a) (i) determine how far from town P did they meet. (4 marks)

(ii) At what time did they meet? (1 mark)

b) A rally driver starts from town Q towards town P at 9.30a.m. If he averages 180km/hr, calculate;

(i) The distance from Q when the rally driver overtook the car. (4 marks)

(ii) The time when the rally driver overtook the car. (1 mark)

24. The table below shows marks obtained by 100 candidates at Eastside High School in a Biology examination.

Marks	15 - 25	25 - 35	35 - 55	55 - 60	60 - 75	75 - 80	80 - 85	85 - 100
Frequency	6	14	24	14	X	10	6	4

(a) Determine the value of X. (2 marks)

(b)State the modal frequency. (1mks)

(c) Calculate the mean mark. (4 marks)

(d) On the grid provided draw a histogram and the use it to determine the median mark.(3 marks)