Name. $\qquad$ Index No $\qquad$
School
Date $\qquad$
Candidate's Signature $\qquad$
$121 / 1$
MATHEMATICS

## PAPER 1

JULY/AUGUST 2012
$21 / 2$ HRS

## BUTERE DISTRICT JOINT EVALUATION - 2012

## Kenya National Examination Council (K.C.S.E)

$121 / 1$
MATHEMATICS
PAPER 1
JULY/AUGUST 2012
$21 / 2$ HRS

## 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 1 and ONLY 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 answers are wrong.
6. Non - Programmable silent electronic calculators and KNEC mathematical tables may be used, except where stated otherwise.

FOR EXAMINERS USE ONLY
Section I

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

Section II

| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | TOTAL |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |  |  |  |

GRAND
TOTAL

1. If $x: y=4: 7$ and $y: £=5: 3$ find the ratio ${ }^{6} . \mathrm{y}: £$
2. Find the equation of a line perpendicular to $2 x+4 Y=8$, which crosses the line at its $y-$ Intercept.
3. Simplify

$$
\begin{equation*}
\frac{6 a^{2}+7 a b+2 b^{2}}{4 a^{2}-b^{2}} \tag{3mks}
\end{equation*}
$$

4. An American tourist arrived in Kenya with 1000 Us $\$$ and converted the whole amount into Kenyan shillings. He spent sh. 40,000 and changed the balance to sterling pound before leaving for united Kingdom. A Kenya bank buys and sells foreign currencies as shown.

Buying (in Kshs)
1 US dollar
1 Sterling Pound
84.2083

Selling ( in Kshs)
84.3806
135.1294

Calculate the amount he received to the nearest sterling pound.
5. Find the area in hectors of a field book neásurement is recorded in metres as follows. (3mks)

6. The sum of the digits in three digit number is nine. The tens ten is digits half the sum of the other two and the hundreds digit is half the units digit. Find the number.
(4mks)
7. The diagram below represents a circular flower bed surrounded by a path of uniform width given that $\mathrm{R}=14 \mathrm{~m}$ and $\mathrm{r}=12.6 \mathrm{~m}$, Calculate to the nearest whole number the area of the path Take $\Pi=\frac{22}{7}$

8. Thê diagram below shows a histogram representing marks obtained in a maths test.


Develop a frequency distribution table for the graph.
(4mks)
9. The acceleration, $\mathrm{ams}^{-2}$, of a particle is given by $\mathrm{a}=25-9 \mathrm{t}^{2}$, where t is time in seconds after the particles passes a fixed point O .
If the particle passes O , With a velocity of $4 \mathrm{~ms}^{-1}$ find.
a) An expression for velocity v , in terms of t .
b) The velocity of the particle when $\mathrm{t}_{6}=2$ seconds.
10. Given that $\mathrm{a}=3, \mathrm{~b}=-1$ and $\mathrm{C}=2$ evaluate

$$
\begin{equation*}
\frac{a-b^{2}}{4-2 b+c} \tag{3mks}
\end{equation*}
$$

11. The figure below shows triangle $P Q R$ in which $P R=12 \mathrm{~cm} . T$ is a point on $P R$ such that $T R$ $=4 \mathrm{~cm}$ Line $S T$ is parallel to QR . If the area of triangle PQR is $336 \mathrm{~cm}^{2}$. Find the area of the quadrilateral.

12. A numbeer $e^{5}$ is such that when its divided by $3,7,11$ or 13 , the remainder is always one. Find the nự̂ber n.
13. Solve for x
$8^{2 x-1}=1$
14. Under an enlargement centre (2,1) the image of $\mathrm{P}(1,-1)$ is $\mathrm{P}^{`}(4,5)$. Determine the scale factor of the enlargement
( 3 mks )
15. The line rotation?

16. Use tables of reciprocal only to work out
$\frac{5}{0.0396}+\frac{12}{0.593}$

## SECTION II ( 50 MARKS)

Answer any FIVE questions in this section in the spaces provided.
17. In The figure, The circle centre O is the circum circle of triangle PQR and also the in circle of triangle ABC .

$$
\begin{aligned}
& \text { Given that angle } \mathrm{BAC}=62^{\circ} \text { and angle } \mathrm{ACB}=44^{0} \\
& \text { Calculate } \\
& \text { a) } \mathrm{PQR} \\
& \text { (2mks) } \\
& \text { b) <QPR }
\end{aligned}
$$

c) $<\mathrm{POQ}$
d) if $\mathrm{BC}=10 \mathrm{~cm}$, calculate the radius of the circle.
(4mks)
18. Tsuma bought some rice at sh 30 per kg .He packed two- fifths of the rice in 2 kg packets which he sold at shs. 85 per packet. He packed the other three- fifths in 3 kg packets and sold thee at shs. 120 per packet. He sold all the rice in this way and made a profit of sh. 4400 .
a) Determine the amount of rice bought.
(4mks)
b) Calculate to one decimal place.
i) The percentage profit he made.
(2mks)
ii) The percentage profit she would have made if he had sold all the rice in 2 kg packet.
(4mks)
19. A certain number of people agreed to contribute equally to buy books worth sh. 12000 for a school library. Five people pulled out so that others agreed to contribute an extra sh. 100 each. Their contribution enabled them to buy books worth sh 2000 more than they originally expected.
a) If the original number of people was $x$, write down.
i) an expression of how much each was originally to contribute.
ii) Two distinct expressions of how much each contributed after the five pulled out.
(2mk)
b) Calculate the valuezof $x$.
c) Calculate how much each person was expected to contribute originally. (2mks)
d) Calculate
i) The number of people who actually made the contribution and how much per person.
ii) The ratio of the supposed original contribution to new contribution. ( 1 mk )
20. Construct a triangle PQT such that $\mathrm{PQ}=10 \mathrm{~cm} \mathrm{QR}=9 \mathrm{~cm}$ and $\mathrm{RP}=8 \mathrm{~cm}$.
i) Construet the locus of the point x such that $\mathrm{QX}=\mathrm{XR}$ and mark with the letter X the point where this locus meets QR .
ii) Construct the locus of the point X such that $\mathrm{QX}=\mathrm{XR}$ and mark with the letter X the point where this locus meets QR
iii) Construct the locus of the point Y such that $\mathrm{PY}=6 \mathrm{~cm}$ and mark with the letter Y , the point where the locus meets PR.
iv) By Shading the unwanted regions show the area bounded by the three loci by the letter T such that $\mathrm{QT} \geq T R$
$\mathrm{PT} \leq 6 \mathrm{~cm}$
$<\mathrm{PRT} \geq<\mathrm{QRT}$
Label the region required by the letter T .
21. The diagram below represents a sofid consisting of a hemispherical bottom and a conical frustum at the top.

a) Determine the value of $x$ and hence the height of the cone.
b) Calculate (i) the surface of the solid.
ii) The volume of the solid.
22. The table below shows Kenya'stax rates a certain year.

| Income (K£ p .a) | Tax rates (Ksh Per £) |
| :---: | :---: |
| 1-5220 | 2 |
| 5221-50440 | 3 |
| 10444-15660 | 4 |
| 155661-20880 | 5 |
| 20881 and above | 6 |

In that y year Mr. Masaku earned a basic salary of ksh 16,000 per month. He is entitled to a hourse allowance of Ksh. 12,000 per month and a medical allowance of Ksh. 2000 per month. Calculate:
a) i) His taxable income per year in pounds.
(2mks)
ii) His monthly gross tax.
(4mks)
iii) The monthly net tax if he is given a relief of Kshs. 1056 per month. ( 2 mks )
b) Other deductions per month are ass follows.
N.H.I.F

Cooperative loan WCPS
Coop shares
sh 488
sh 2000
23.

The diagram shows two intersecting circles of radii 20 cm and 15 cm such that their centres $A$ and $B$ are 30 cm apart.


Calculate to 2 decimal places.
a) The area of sector ACD
b) The area of sector BCD
c) The length of the common CD.

## d) The area of quadrilateral ACBD

e) The shaded area.
24. Draw the quadrilateral $\mathrm{A}=(-6,-1), \mathrm{B}(-6,-4), \mathrm{C}(3,-7)$ and $\mathrm{D}(3,2)$.

On the same grid draw the image.
a) $\mathrm{A}^{\wedge} \mathrm{B}$ ` $\mathrm{C}^{\prime} \mathrm{D}^{\prime}$ under an enlargement centre ( $\mathrm{O},-1$ ) scale factor $1 / 3$
 angle of $90^{\circ}$.

d) $\quad A^{\text {III }} B^{\text {III }} C^{\text {III }} D^{\text {III }}$ the image of $A^{\text {III }} B^{\text {III }} C^{\text {III }} D^{\text {III }}$ under a translation $\binom{-2}{3}$ and write down the co - ordinates of the final image.

