END OF TERM 1 EXAMS

MATHEMATICS

FORM THREE
PAPER 1

TIME: 2 ½ HOURS

NAME……………………………………………………ADM NO:……………………

SIGN…………………………………………………… INDEX NO:…………………

SECTION I (50MARKS): *Answer all questions in this section*

1   Without using tables or calculators, evaluate. (3MKS)

$$\sqrt{\frac{0.38 \times 0.23 \times 2.7}{0.114 \times 0.0575}}$$

2   Without using a calculator or tables, find the value of y given that $y = (a+b)(x-c)^2$ and a = 5 , b =6 ,x = -3 and c = 2.   (3mks)

3   Solve the following inequalities and represent the solution on a single number line.

$$3 - 2x < 5$$

$$4 - 3x \geq - 8.$$ (3mks)

4   Use the reciprocal, square and square-root tables to evaluate to 4 significant figures the expression.

5   A Kenyan bank buys and sells foreign currencies at the exchange rates shown below.

$$\sqrt{\frac{1}{24.56} + 4.346^2}$$

	BUYING (KSHS)	SELLING (KSHS)
1Euro	147.56	148.00
1U.S Dollar	74.22	74.50

An American arrived in Kenya with 20,000 Euros. He converted all the Euros into Kenyan Shillings at the bank. He spent Kshs.2,510,200 while in Kenya and converted the remaining Kenya shillings into U.S Dollars at the bank. Find the amount in dollars that he received.   (3mks)

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6   A train whose length is 60 metres is travelling at 40km/h in the same direction as a bus whose length is

20m.If the speed of bus is 80km/h and moving parallel to the train, calculate the time it takes the truck to

overtake the train completely in seconds.   (3mks)

7   Translation Q is represented by the column vector $\begin{pmatrix} 6 \\ 3 \end{pmatrix}$ and another translation R by the column

vector $\begin{pmatrix} -4 \\ 2 \end{pmatrix}$. A point S is mapped onto a point T by Q and a point T is mapped onto a point U by R.If

point U is (8 , - 4) ,determine the co-ordinates of point S.   (3mks)

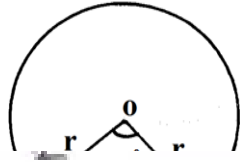8   Solve for t in the equation

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

9   Mboya paid Kshs.160 for a blouse after getting a discount of 20%.The vendor made a profit of 30% on the sale of this blouse. What percentage profit would the vendor have made if no discount was allowed? (3mks)

10   The base of a triangle is 3cm longer than its height. Given that the area of the triangle is 35cm^2, determine the height of the triangle. (3mks)

11   Solve for X in the equation.   (3mks)

12   The figure below shows a circle centre O. Chord AB subtends 30^0 at the centre. If the area of the minor segment is 5.25cm^2, find the radius of the circle.   (3mks)

Solve for X in the equation.

$$\frac{6x-4}{3} - \frac{2x-1}{2} = \frac{6-5x}{6}$$

13   A certain two – digit number is equivalent to five times the sum of the digits. It is found to be 9 less than the number formed when the digits are interchanged. Find the number.   (3mks)

14   The surface area of two similar bottles are 12cm^2 and 108cm^2 respectively. If larger one has a volume of 810cm^3.Find the volume of the smaller one.   (3mks)

15   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.   (3mks)

16   Mwathi spends one-third of his salary on food, one – quarter on rent, three – fifth of the remainder on transport and saves the rest. If he spends Kshs.1800 on transport, find how much money he saves.

(3mks)

SECTION II (50MARKS)
Choose any five questions only

17 A bus left Makindu at 11.45 a.m and traveled towards Mombasa at an average speed of 80km/h. A Nissan Matatu left Makindu at 1.15 p.m on the same day and traveled along the same road at an average speed of 120km/hr. The distance between Makindu and Mombasa is 400km.

a) Determine the time of the day the Nissan overtook the bus. (5 marks)

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b) Both vehicles continue towards Mombasa at their original speeds. Find how long the Matatu had to wait at Mombasa before the bus arrived. (5 marks)

18   A frustum of a cone is such that one of its ends is hemispherical with a radius of 2lcm and the other top end is circular with a radius of 10.5cm .The perpendicular distance between the centres of the circular parts is 20cm. Find;

(a)   The slant length of the original cone. (3 mks)

(b)   The slant length of the frustum.   (2mks)

(c)   The surface area of the frustum.   (5 mks)

19   The angle of elevation of the top of a flagpole from a point A on a level ground is 13^0. The angle of elevation of the top of the flagpole from another point B nearer the pole and 12m from A is 30^0.
Find;

a)   i)   The height of the flagpole   (5mks)

      ii)   The distance from point B to the top of the flagpole.   (2mks)

b) Given that tan $\propto$ = 0.75, without using tables or a calculator find Cos (180 - $\propto$)
        (3mks)

20.   The vertices of triangle PQR are P(O,O), Q(6, 0) and R(2, 4)
       (a) Draw triangle PQR on the graph paper provided.   (lmk)
       b).   Triangle $P^1Q^1R^1$ is the image of a triangle PQR under an enlargement scale factor, ½ and centre (2, 2). Write down the coordinates of triangle $P^1Q^1R^1$ and plot on the same grid.(3 mks)

       c).   Draw triangle $P^{11}Q^{11}R^{11}$ the image of triangle $P^1Q^1R^1$ under a positive quarter turn about points (1, 1). (3 mks)

       d).   Draw a triangle $P^{111}Q^{111}R^{111}$ the image of triangle $P^{11}Q^{11}R^{11}$ under reflection in the line y=l.
              (3mks)

21 A tailor bought a number of suits at a cost of sh.57,000 from Ken-suit wholesalers. Had he bought the same number of suits from Umoja wholesalers it would have costed him sh.480 less per suit. This would have enabled him to buy 4 extra suits for the same amount of money.

a) Find the number of suits the tailor bought. (6 marks)

b) The tailor later sold each suit for sh.720 more than he had paid for it. Determine the percentage profit he made. (4 marks)

22   Patients who attended clinic in one week grouped by age as shown in the table below.

X Age (years)	No. of patients
0 - 5	14
5 - 15	41
15 - 25	59
25 - 45	70
45 - 75	15

a)   Estimate the mean age.   (4mks)

b)   On the graph provided , draw a histogram to represent the distribution.   (6mks)

23   Four towns P, R, T and S are such that R is 80km directly to the north of P and T is on a bearing of 290° from P at a distance of 65km. S is on a bearing of 330° from T and a distance of 30 km. Using a scale of 1cm to represent 10km, make an accurate scale drawing to show the relative position of the towns. (4mks)
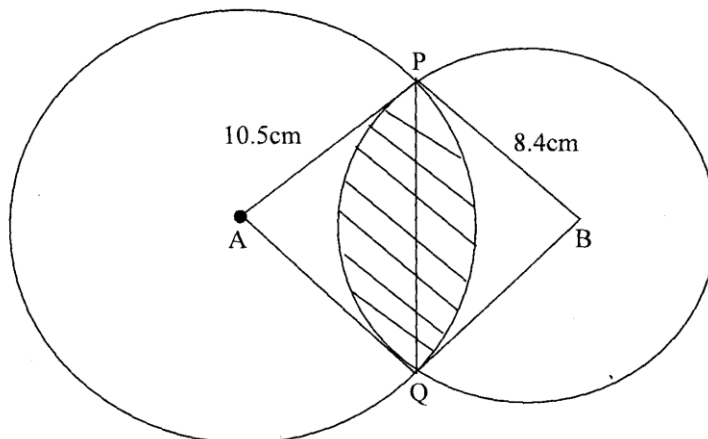
Find:
(a)   The distance and the bearing of R from T   (3mks)

(b)   The distance and the bearing of S from R   (2mks)

(c)   The bearing of P from S   (lmk)

24. The figure below shows two circles of radii 10.5 and 8.4cm and with centres A and B respectively. The common chord PQ 9cm.

(a)   Calculate angle PAQ.   (2 mks)

(b)   Calculate angle PBQ.   (2 mks)

(c)   Calculate the area of the shaded part.   (6 mks)