MATHEMATICS
END OF TERM II EXAM
TIME: 2HOURS

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 I and 3 questions in Section II.**
4. Show all the steps in your calculations in the spaces provided, giving your answers at each stage in the spaces below each question.
5. Marks may be given for correct working even if the answer is wrong.
6. Non- programmable silent electronic calculators **and KNEC** Mathematical tables may be used.

SECTION A: 40MKS

1) Evaluate $\dfrac{-4 \text{ of } (-4 + -15 \div 5) + -3 - 4 \div 2)}{84 \div -7 + 3 - - 5}$ (3mks)

$$Ans = \frac{-4 \text{ of } (-4-3) + -3 - 2}{-12 + 3 + 5}$$

$$= \frac{-4 \text{ of } -7 + -5}{-4}$$

$$= \frac{23}{-4}$$

2) Express the following numbers in terms of their prime factors.   (2mks)

$$196 = 2 \times 2 \times 7 \times 7$$

$$= 2^2 \times 7^2$$

3) Three tanks are capable of holding 36, 84 and 90 litres of milk. Determine the capacity of the greatest vessel which can be used to fill each one of them an exact number of times.
(2 mk)

$$No. = \frac{GCD \times LCM}{No.}$$

$$= \frac{30 \times 900}{60}$$

$$= 450$$

$$No = \frac{300 \times 900}{150}$$

$$= 180$$

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4) The cost of 5 skirts and 3 blouses is sh. 1750. Mueni bought three of the skirts and one of the blouses for sh.850. Find the cost of each item. (3 mks)

$$\begin{pmatrix} 5s + 3b = 1750 \\ 3s + b = 850 \end{pmatrix} \begin{matrix} 1 \\ 3 \end{matrix}$$

$5s + 3b = 1750$
$9s + 3b = 2250$
_____

$4s \quad 0 = 800$

$4s = 800$
$s = 200$

$b = 850 - 3s$
$= 850 - 3 \times 200$
$= 250$

2) Forty five men can construct a road 210m long in 60 days. What length would be constructed by 72 men in 50 day assuming that all work at the same rate? (3mks)

$No. = \dfrac{72}{40} \times \dfrac{50}{60} \times 210$

$= 180$

3) Using tables to find the Square root of 0.146 (2mks)

$\sqrt{0.146} = \sqrt{14.6 \times 10^{-2}}$

$= \sqrt{14.6 \times 10^{-2}}$

$Ans = 3.821 \times 10^{-1}$

$= 0.3821$

4) The figure below shows a circle centre O. ChordAB subtends 30° at the centre. If the area of the shaded section is 5.25cm², find the radius of the circle $\left(Take\ \pi = \dfrac{22}{7} \right)$ (3mks)
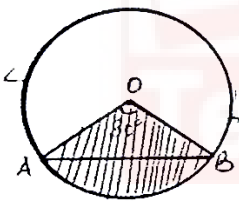
$A = \dfrac{\theta}{360} \pi r^2$

$5.25 = \dfrac{30}{360} \times \dfrac{22}{7} \times r^2$

$r^2 = \dfrac{5.25 \times 360 \times 7}{30 \times 22}$

$r^2 = 20.045$
$r = 4.477$

5) Juma, Ali and Hassan share the profit of their business in the ratios 3:7: 9 respectively. If Juma receives Ksh 60000. How much profit did the business yield? (2mks)

J : A : H
3 : 7 : 9

$3 + 7 + 9 = 19$

$\dfrac{3}{19} = 60,000$

$profit = 60,000 \times \dfrac{19}{3}$

$= 380,000$

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6) The exterior angle of a regular polygon is an eighth of the interior angle. How many sides does the regular polygon have? (3 marks)

$$x + \tfrac{1}{8}x = \tfrac{9}{8}x$$
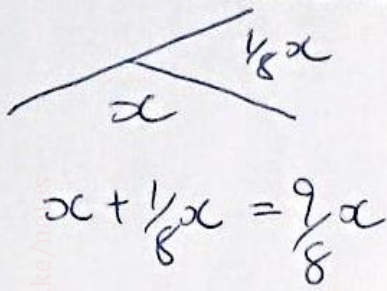
$$\frac{9}{8}x = 180$$

$$x = 180 \times \frac{8}{9}$$

$$= 160^{\circ}$$

Ext. $\angle = 20^{\circ}$

No. of sides $= \dfrac{360}{20}$

$= 13 \text{ sides}$

7) Express each of the following as a fraction; (2 mks)

$$3.\dot{7}\dot{2}$$

$$r = 3.7272$$
$$100r = 372.72$$
$$-r = 3.72$$
$$\overline{99r = 369}$$

$$r = \frac{369}{99}$$

8) Find the ratio of x: z if x: y=9:10 and y:z=5:3. (3mks)

$$\begin{array}{c} x:y \\ y:z \end{array} = \begin{array}{c} (9:10)\,5 \\ (5:3)\,10 \end{array}$$

$$= \begin{pmatrix} 45:50 \\ 50:30 \end{pmatrix}$$
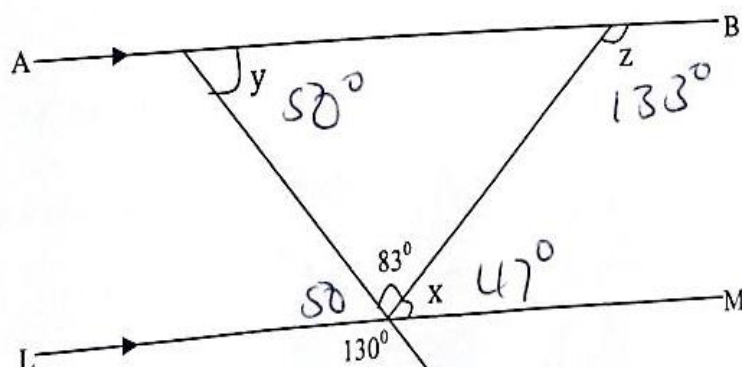
$x:z = 45:30$
$= 9:6$
$= 3:2$

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

Find the values of the angles marked x, and z. (2 mks)

10) Solve for y in the following equation;(3mks)

$$\frac{y+3}{3} + \frac{y-3}{4} = \frac{1}{12}$$

$$\frac{4(y+3) + 3(y-3)}{12} = \frac{1}{12}$$

$$\frac{4y + 12 + 3y - 9}{12} = \frac{1}{12}$$

$$\frac{7y - 3}{12} = \frac{1}{2}$$

$$14y - 6 = 12$$

$$14y = 6$$

$$y = \frac{6}{14} = \frac{3}{7}$$

11) A Kenyan company received US Dollars 100,000. The money was converted into Kenya shillings in a bank which buys and sells foreign currencies as follows:
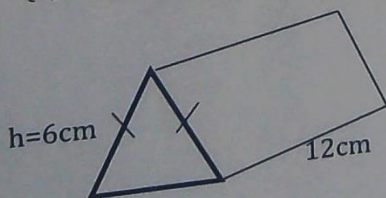
	Buying (in Kenya shillings)	Selling (in Kenya shillings)
1 US Dollar	77.24	77.44
1 Sterling Pound	121.93	122.27

Calculate the amount of money, in Kenya shillings, the company received. (3mks)

$$100,000 \times 77.24 = 7724000$$

12) The diagram below show a triangular prism.

(a) Find the surface area of the prism. 5mks

h=6cm

12cm

6cm

$$A_\triangle = \frac{1}{2} \times 6 \times 6 \times 2 = 36 \text{ cm}^2$$

$$A_L = 12 \times 52 \times 2 = 124.8 \text{ cm}^2$$

$$A_L = 6 \times 12 = 72.0 \text{ cm}^2$$

$$232.8 \text{ cm}^2$$

$$hyp = \sqrt{36 - 9}$$

$$= \sqrt{27}$$

$$\sqrt{27} = 5.2$$

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SECTION II(Answer ALL questions in this section)

13) The table below shows a time table for a public surface vehicle operating between two towns A and D via town B and C.

town	Arrival time	Departure time
A		8:20am
B	10:40pm /2240hrs	11:00am
C	2:30 pm / 14.30 hrs	2:50pm
D	4:00 pm	

(i) At what time in 24hour clock system:

a) The vehicle leaves town A.   2mks

O8 20 hrs

b) The vehicle arrives in town D.   2mks

12:00
4 00
1600 hrs

c) How long does it take to travel from town A to D. 4mks

22 40hrs
08 20 hr
14 20 hrs

24 00
-22 40
1 20 hrs

1100hrs from Mid. Nt.

14 30 hrs
-11 00 hrs
3 30 hrs

20min.

1600
1450
110hrs
Time = 1420 + 120 + 110i
330 + 20min + 1
= 3140 hrs

d) If the distance between the two towns A and D is 900km, find the average speed of the vehicle. 2mks
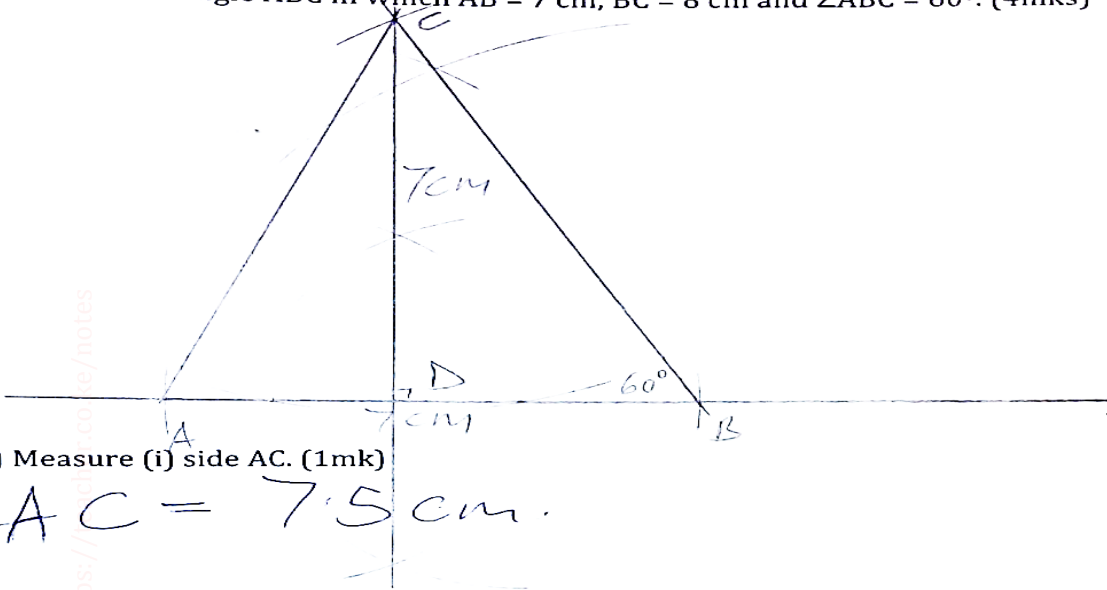
$S = \dfrac{D}{T}$

$= \dfrac{900km}{31.67 hrs}$

$S = 22.48$

$= 28.42 km/hr.$

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$A_A = \frac{1}{2} \times 2 \times 2.5 = 2.5 \text{ cm}^2$

$A_B = \frac{1}{2} \times 5.5 \times 7.5 = 20.625 \text{ cm}^2$

$A_C = \frac{1}{2} \times 2.5 \times 7 = 8.75 \text{ cm}^2$

$A_D = \frac{1}{2} \times 4 \times 2 = 4 \text{ cm}^2$

$A_E = \frac{1}{2} \times 9 \times 8.5 = 38.25 \text{ cm}^2$

$A_F = \frac{1}{2} \times 5 \times 6 = 15 \text{ cm}^2$

$\overline{89.15 \text{ cm}^2}$

$1 \text{ cm} = 280 \text{ m}$

$1 \text{ cm}^2 = 78400 \text{ m}^2$

$89.15 \text{ cm}^2 = x$

$x = \dfrac{78400 \text{ m}^2 \times 89.15 \text{ c.}}{10,000 \text{ m}^2}$

$= 698.936 \text{ ha.}$

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. Use a ruler and a pair of compasses only in this question.

Construct triangle ABC in which AB = 7 cm, BC = 8 cm and ∠ABC = 60⁰. (4mks)

) Measure (i) side AC. (1mk)

$$AC = 7.5 \, cm.$$

i) ∠ ACB. (1mk)

$$\angle ACB = 54^{o}$$

c) On the same diagram, drop a perpendicular from C to meet AB at D. Measure CD hence calculate the area of the triangle (4mks)

$$A_{\Delta} = \frac{1}{2} \times b \times h$$
$$= \frac{1}{2} \times 7 \times 7$$
$$= 24.5$$