NAME ………………………………………………………………………ADM. NO. ……………………………..

 CLASS …………………………………….

121/1

MATHEMATICS ALT A

JULY/AUG 2017

2½ HRS

END OF TERM II EXAM

Instructions

(a) Write your name, class and admission number.

(b) Answer all the questions in section 1 and ONLY Five in section II.

(c) Show all the calculations in the spaces provided

(d) KNEC mathematical tables and non-programmable calculators may be used.

For Examiners Use

Section 1

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

Section 11

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | Total |
|  |  |  |  |  |  |  |  |

|  |
| --- |
| Grand total |
|  |

**SECTION I: 50 Marks Answer All Questions In This Section**

1. Without using a calculator or a mathematical table evaluate: (3mks)

6/7 - 14/3 ÷ 8 x -2/3

 -2 x 3 +(14÷7) x -3

1. Construct a triangle PQR with PQ=5.8cm,QR= 3.4cm and PR= 4.1cm. Draw a circle passing through PQR. Measure its radius . (4mks)
2. Use logarithm tables to evaluate. (4mks)

 3 384.16 x 0.0625

 96.04

 3 384.16 x 0.0625

 96.04

1. The exterior angle of a regular polygon is equal to one third of the interior angle. Calculate the number of sides of the polygon. (3mks)
2. A Kenyan Bank buys and sells foreign currencies as shown.

|  |  |  |
| --- | --- | --- |
|  | Buying (Ksh) | Selling(Ksh) |
| 1 Euro | 84.15 | 84.26 |
| 50 Japanese Yen | 65.37 | 65.45 |

A Japanese was travelling from France to Kenya with 5,000 Euros. He converted all 5,000Euros to Kenya Shillings at the bank. While in Kenya he spent a total of Kshs 289,850 and then converted the remaining Kenya shillings to Japanese Yens at the bank. Calculate the amount in Japanese Yens that he received. (3mks)

1. A triangular flower garden measures 10m, 15m and 24m. Find the area of the garden. (3mks)
2. A two digit number is such that its value is equal to four times the sum of its digits. If the digits are interchanged, the new number formed exceeds two thirds of the original number by 52. find the number. (3mks)
3. Find the co-ordinates of P if OP= OA+OB-OC and the co-ordinates of the points A,B and C are

(3,-4), (-3,4) and (-3,-4) respectively . (3mks)

1. Solve for m in the equation:
2. $\left(\frac{1}{27}\right)^{m}× 81^{-1}=243$ (2mks)
3. Given that sin(90-A)= $\frac{1}{2}$ , find without using trigonometric tables the value of tan A. (2mks)
4. List the integral values of x which satisfy the inequalities.

2x + 21 > 15– 2x ≥ x + 6 (3marks)

1. Use tables of reciprocals only to work out (3 Marks)

$\frac{3}{0.6735}$ + $\frac{13}{0.156}$

1. Find the equation of a line through the point (2, 1), perpendicular to the line

$\frac{1}{2}x+2y=-3$ the form y=mx+c. (3 marks )

1. A quantity V is partly constant and partly varies inversely as the square root of W. If W=2 when V= 14 and W= 3 when V=9 ,write an equation connecting V and W. Hence find V

when W= 6. (4mks)

1. Find the inverse of the matrix below. (2mks)

 A = 4 2

 6 5

1. The diagram below represents a prism of length 6cm whose cross-section is an equilateral triangle of sides 3cm. Draw a well labelled sketch of the net of the prism. (3 Marks)

6cm

C

B

E

A

3cm

3cm

3cm

D

F

1. Five people can build 3 huts in 21 days. Find the number of people, working at the same rate that will build 6 similar huts in 15 days. 2 marks

**SECTION II: 50MKS . Answer Only Five Questions in this Section**

1. In the figure below, TA is a tangent to the circle ABCD with centre O. < TAD=48o and <BOD =1160 . $<ATD=26^{o}$

 A

48o

 D 26o  T

 B

  c

Giving reasons Calculate:

1. <ACD (2mks)
2. <ABO (2mks)
3. <ADO (2mks)
4. <ACB (2mks)
5. <AOB (2mks)
6. Solve the inequality below and show the solution on a number line

4x-3< 6x-1<3x+8 (2mks)

1. List all the integral values of x which satisfy the inequality: (2mks)

 $\frac{4 + x }{-3} >3x+2> -13$

1. Find the inequalities that satisfy the unshaded R shown in the figure below. (6mks)

 y-axis

2

 R

 -1 2 X-axis

1. Every Sunday, Chalo drives a distance of 80Km on a bearing of 074o to pick his brother Ben to go to church. The church is 75Km from Ben’s house on a bearing of S500 E. After church they drive a distance of 100Km on a bearing of 2600, to check on their father before Chalo drives to Ben’s home to drop him off then proceed to his house.
2. Using a scale of 1cm to represent 10km show the relative position of these places. (4mks)
3. Use your diagram to determine:
4. True bearing of Charo’s from father’s home. (1mk)
5. The compass bearing of the father’s home from Ben’s home (1mk)
6. The shortest distance between Ben’s home and Father’s home. (2mks)
7. The total distance Chalo travels every Sunday (2mks)
8. A saleswoman is paid a commission of 2% on goods sold worth over Ksh 100,000.She is also paid a monthly salary of Ksh 12,000.In a certain month, she sold 360 handbags at Ksh 500 each.
9. Calculate the saleswoman’s earnings that month. (3 mks)
10. The following month, the saleswoman’s monthly salary was increased by 10%.Her to total earnings that month were Ksh 17,600.

Calculate:

* 1. The total amount of money received from the sales of handbags that month. ( 5mks)
	2. The number of handbags sold that month. (2 mks)
1. A stadium can fully maximize on profits if 72,000 people are accommodated. Each row of seats accommodates the same number of people. On a certain day, 25 rows were defective and it was therefore decided that each of the remaining rows would have to squeeze in 40 more people.
2. Calculate:
3. How many people each row of seats accommodate. (5mks)
4. The number of rows in the stadium
5. from the total tickets sale, if 1/8 is used on repairs of the defective rows and 1/7 of the remainder on other expenses, kshs. 4,320,000 is left. Calculate the value of each ticket. (5mks)
6. The co-ordinates of a triangle ABc are A(1,1), B(3,1) and C(1,3).
7. Plot triangle ABC on the graph paper provided below (1mk)



1. Triangle ABC undergoes translation of vector 2

 2

Obtain the image A1B1C1 under the translation. Write co-ordinates of A1B1C1  (2mks)

1. A1B1C1 undergoes a reflection along the line x=0, obtain the co-ordinates and plot on the graph points A11B11C11  under transformation. (3mks)
2. Triangle A11B11C11 undergoes an enlargement scale factor -1, centre origin. Obtain the co-ordinates of the image A111B111C111  (2mks)
3. The triangle A111B111C111 undergoes a rotation centre(1,2) and angle1200. Obtain the co-ordinates of the image AivBivCiv  (2mks)
4. The figure below shows a glass informs of a frustum of a cone whose top and bottom diameter are 7cm and 3.5 cm respectively. Its depth is 10cm.

 7cm

 10cm

 3.5cm

Taking п = 22/7; calculate

1. Its total surface area (5mks)
2. Its capacity to the nearest litres (5mks)

1. The position vectors of points A and B with respect to the origin O, are $\left(\begin{matrix}-8\\5\end{matrix}\right)$ and $\left(\begin{matrix}12\\-5\end{matrix}\right)$ respectively. Points M is the mid point of AB and N is the mid point of OA.
2. Find:

 i) The coordinates of N and M; (3 mks)

 ii) The magnitude of NM (3 mks)

1. Express vector NM in terms of OB. 1 mk
2. Point P maps onto P’ by a translation vector$\left(\begin{matrix}-5\\8\end{matrix}\right)$ . given that OP=OM + 2MN, find the coordinate of P’. 3 mks