Name ………………………………………………………………………Adm. No. ……………………………..

 Class …………………………………….

121/1

MATHEMATICS ALT A

2½ HRS

Instructions

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

(b) Answer all the questions in section 1 and ONLY Five in section 11.

(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 | 24 | Total |
|  |  |  |  |  |  |  |  |  |

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

1. Evaluate without using a calculator. [3 Marks]

$$\frac{1\frac{1}{2}×4\frac{3}{5}-1\frac{3}{5}}{3\frac{1}{5}+7\frac{1}{2}÷1\frac{1}{2}}$$

1. When a number is multiplied by 3 and two added to the product, the result is the same as subtracting one from the number then multiplying this by four. Find the number. [2 Marks]
2. Three similar steel bars of length 200cm, 300cm and 360cm are cut into equal pieces. Find the largest possible area of a square that can be made from any of the three pieces. [3 Marks]
3. A of 10 soldiers set off with enough food to last 7 days. After 4 soldiers deserted, how many more days will the food last the remaining soldiers? [3 Marks]
4. The scale of a map is given as 1:500000. Find the actual area in hectares of a region represented by square of sides 10cm. [3 Marks]
5. A watch loss 30 seconds every hour and was set to read the correct time at 0545h Monday. Determine the time in 12 hrs system the watch will show on Friday at 1945hrs. [3 Marks]
6. A two digit number is such that the sum of the digits is 12. If the digits are interchanged, the value of the new number formed is fifteen more than twice the value of the value of the original number. Find the original number. [4 Marks]
7. Express the following numbers as a product of its prime-factors in power form.
	1. 288 [2 Marks]
	2. 1980 [2 Marks]
8. I have a packet of sweets. When I try to share them equally among 2,3,4,5 and 6 children, I always have one left over. What is the minimum number of sweets that can be in the packet? [3 Marks]
9. Otieno miscopied 98 as 89. He multiplied 89 by a certain number and got 4005. Find that number and the correct product.[2 Marks]
10. Evaluate [3 Marks]

$$\sqrt{11\frac{1}{9}} ×\sqrt{2\frac{14}{25}}$$

1. Use elimination method to solve the simultaneous equation. [3 Marks]

$$x-2y=27$$

$$7x+y=9$$

1. Simply the following expressions. [4 Marks]
2. $\sqrt{9x^{2}y^{4}}$
3. $\sqrt{645^{2}t^{10}}$
4. $\sqrt[3]{64y^{6}Z^{18}}$
5. $\sqrt[3]{275^{\frac{1}{9}}T^{\frac{8}{27}}}$
6. A rectangle measures 20cm by 15cm. if each dimension is increased by 2cm, find the percentage increase in area. [3 Marks]
7. Given that $x=y, y=3 and z=\frac{2x}{3y},$ evaluate the value of $\frac{x+y}{2z+3x}$ [3 Marks]
8. A wooden block measuring 20cm by 30cm by 50cm has mass of 22.5kgs. find the density of the wood in g/cm3. [3 Marks]

**SECTION B**

*Answer any 5 Questions*

1. The boundaries PQ, QR,RS and SP of a piece of land are straight lines such that Q is 16km on a bearing of 400 from P, R is directly south of Q and east of P and S is 12km on a bearing of 1200 from R.
	1. Using a scale of 1:400000, represent the above information on a scale drawing. [4 Marks]
	2. Calculate
		1. The distance from P to S. [1 Mark]
		2. The distance of Q from S [1 Mark]
		3. The bearing of S from Q [1 Mark]
	3. The area of the piece of land PQRS in hectares. [3 Marks]
2. The table below shows the values of $x$ and$ y$ of two equations.

$$2x+3y=17 4x-y=13$$

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| $$x$$ | 1 | 2 | 3 | 4 | 5 | 6 |
| $$y$$ | 5 | - | - | 3 | - | - |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| $$x$$ | 1 | 2 | 3 | 4 | 5 | 6 |
| $$y$$ | - | - | 4 | - | - | - |

* 1. Calculate the tables [2 Marks]
	2. (i) Using the graph paper provided and using a suitable scale, plot the coordinates of the two

equations. [4 Marks]

(ii)Hence or otherwise solve the simultaneous equations. [2 Marks]

* 1. Use the values in b(ii) above to evaluate; [2 Marks]

$$\frac{x^{2}+y^{2}}{2xy}$$

* 1. Construct a triangle XYZ such that XY=7.5cm. <ZXY = 630 and < ZYX= 580. [3 Marks]
	2. Measure line XZ [1 Mark]
	3. Drop a perpendicular from Z to touch line XY at K. Measure ZK [3 Marks]
	4. calculate the area of $∆$XYZ [3 Marks]
1. the following measurements were gotten from a surveyors field book

Z

400

TO E 200 300 TO F 120

200

150 TO D 100

100

TO C 180 60 TO B 50

40

A

* 1. By using an appropriate scale, draw the accurate figure on the space provided. (Measurement in Metres). [5 Marks]
	2. Calculate the total area of the piece of land in hectares. [5 Marks]
1. a. Use the figure below to answer the questions that follow.

D C D C

6cm

 10cm 6cm 10cm

A 5cm B A B

Find:

* + 1. The area of triangle ABC [2 Marks]
		2. The length of the perpendicular from B to AC [2 Marks]
	1. PQRS is a trapezium with area 88.2cm2. PQ is parallel to RS. If PQ=9.4cm and the distance between PQ and RS is 6.3cm. Find the length of RS.[3 Marks]
	2. The diagonals of a rhombus measure 16cm by 12cm. Calculate the area of the rhombus. [3 Marks]
1. A supermarket bought 600 trays of eggs at shs. 120. Each tray contains 30 eggs. The eggs were repacked into smaller trays each holding 6 eggs. During the repacking 10% of the eggs were found either bad or broken and could not be sold. The small trays were sold at shs. 30 each.
	1. How much did one egg cost in the supermarket. [2 Marks]
	2. How much was received from the sale of the eggs. [2 Marks]
	3. How much money was lost due to breakage or bad eggs? [2 Marks]
	4. How much profit was realized? [2 Marks]
	5. Calculate the percentage profit [2 Marks]
2. There are 8 lessons of 40 minutes each in Gatwe Secondary school. Students are supposed to report 1 hour before assembly in the morning. The school assembly takes 15 minutes. There is a 20 minutes break after the first 3 lessons and lunch break is 1hr 10minutes after the next 3 lessons. Games start 10 minutes after the last lesson and go on for 2 hours. Students go home at 5.30pm
	1. How much time are the students supposed to spend in school.[2 Marks]
	2. At what time are the students supposed to report at school[2 Marks]
	3. When does the first lesson begin. [2 Marks]
	4. At what time do the students go for lunch. [2 Marks]
	5. When does the last lesson end. [2 Marks]
3. a. A form is in the shape of trapezium ABCD.

 D 500M c

 300M 320M

 A 800M B

AB is parallel to DC, AB=800m, BC=400 CD = 500m DA=300m and <DAB = 600

* + 1. using a suitable scale, draw the plan of the farm [3 Marks]
		2. Find the area of the farm in hectares. [3 Marks]
	1. The scale of a map is 1:250000. Calculate the area in m2 OF A GAME PARK ON A map whose actual area is 25km2[4 Marks]