**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Index No\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**School \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Candidate’s Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**121/1**

**MATHEMATICS ALT A**

**PAPER 1**

**MARCH/APRIL 2020**

2 ½ Hours

**ARISE AND SHINE TRIAL 1 EXAM**

**MARCH/APRIL, 2020**

**Instructions to Candidates**

1. *Write your name and index number in the space provided above.*
2. *Sign and write the date of examination in the space provided above.*
3. *This paper consists of* ***TWO*** *sections:* ***section I*** *and* ***section II***
4. *Answer* ***all*** *the questions in* ***section I*** *and on only* ***five*** *questions from* ***section II***
5. ***Show all the steps in your calculations, giving your answers at each stage in the spaces provided below each question****.*
6. *Marks may be given for correct marking even if the answer is wrong*
7. ***Non-programmable*** *silent calculator* ***and*** *KNEC Mathematical tables may be used, except where stated otherwise.*
8. ***The paper consists of 15 printed pages.***
9. ***Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.***
10. ***Candidates should answer the questions in English***

**For Examiner’s Use Only**

**Section I**

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

**Section II Grand Total**

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

**SECTION I [50 marks]**

***Attempt All the Questions***

1. Evaluate ½ of 3 ½ + 1 ½ (21/2 – 2/3 ) (3 marks)

 ¾ of 2 ½ ÷ ½

1. Mr.Rotich decided to honour his top 3 students in Mathematics by sharing sh 12,000 in the ratio 6:5:x for the first, second and third student respectively. If student number 2 got sh 4,000, find the value of x. . (3 marks)

1. Express 3.0$\ddot{23}$ as a fraction. (2 marks)
2. O is the center of the circle below and AB is parallel to DC. Angle ACD=70o and angle ACB=10o (3 marks)

 

Calculate the angles:

1. ABC (2 marks)
2. OAD (2marks)
3. A sphere has a radius of 3.0cm. Find its density if the sphere has a mass of 100grams.

 (3 marks)

1. Use reciprocal table to evaluate reciprocal of 0.3654. Hence find $\frac{\sqrt{3.24}}{0.3654}$ to 3 significant figures (3 marks)
2. Below is a net of a model of a 3- dimensional figure. The lengths AB=BC=AC=6cm and lengths AF = FB = BD = CD = CE = AE = 8.0 cm. (3 marks)

 F D

 8cm 8cm

 8cm 8cm

 B

 A 6cm C

 8cm 8cm

 E

1. Sketch the solid model taking ABC as the base and height 5cm. (2 marks)
2. Name the figure sketched. (1 mark)
3. Using logarithm tables, evaluate. (4 marks)

 $\sqrt[3]{47.26x0.866}$2

 345.8

1. A line has the equation 3x – 2y – 5 = 0. Find:
2. The gradient of the line. (1mark)

1. The equation of the line in the form y = mx+c that passes through the point (4,6) and is perpendicular to the given line. (3 marks)
2. The exterior angle of a regular polygon is (x-50)o and the interior angle is (2x+20)o. Find the number of sides of the polygon. (3 marks)
3. Simplify $\frac{x-5}{x+5}$ - $\frac{7x-35}{x-25}$ (3 marks)

1. The cost of a camera outside Kenya is US $1,000 Jane intends to buy one camera through an agent who deals in Japanese. The agent charges her a commission of 5% on the price of the camera and further 1260 Yen as importation tax. How much Ksh will she need to send to the agent to obtain the camera, given that (4 marks)

 1 U $ = 105.00 Yen

 1 US$ = Ksh 63.00

1. Given that **a** $\left(\genfrac{}{}{0pt}{}{2}{3}\right)$ and **c** = $\left(\genfrac{}{}{0pt}{}{3}{5}\right)$ and **a** + 2**b** = **c**. Find:
2. **b** (2 marks)

1. Magnitude of (**a** + **b**) correct to 2 decimal places (2 marks)
2. A circle of radius 10.5cm has a sector whose angle at the centre of 12o is cut off. Find the perimeter of the resulting sector. (2 marks)
3. Find all integral values of x which satisfy the inequalities x + 11 > 4x - 19 ≥ (2 - x)

 (3 marks)

1. A number q is such that when it is divided by 27, 30 and 45 the remainder is always 3. Find the smallest value of q. (2 marks)

**SECTION II – 50**

**Attempt Only Five Questions**

1. A passenger train travelling at 25Km/hr is moving in the same direction as the truck travelling at 30km/hr. The railway line runs parallel to the road and the truck takes 1 ½ minutes to overtake the train completely.
2. Given that the truck is 5m long determine the length of the train in metres. (6 marks)
3. The truck and the train continue moving parallel to each other at their original speeds. Calculate the distance between them after 4 minutes and 48 seconds after the truck overtake the train. (2 marks)
4. The truck stopped 45 minutes after overtaking the train. How long did the train take to catch up with the truck? (2 marks)
5. The table below shows the distribution of marks scored by 40 students in an examination.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Class interval | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85-89 | 90-94 | 95-99 |
| Frequency | 2 | 3 | 6 | 11 | 8 | x | 2 | 1 |

1. Find the value of x (1 mark)
2. State the modal class (1 mark)
3. Calculate the mean mark correct to 2 d.p (4 marks)
4. Calculate the median mark (4 marks)
5. A school water tank is in the shape of a frustum of a cone, the height of the tank is 7.2m and the top and bottom radii are 6m and 12m respectively.
6. Calculate the slant height of the frustum, correct to one decimal place. (2 marks)
7. Calculate the area of the curved surface of the tank correct to 2 d.p. (3 marks)
8. Find the capacity of the tank, in litres correct to the nearest litre. (3 marks)
9. On a certain day, the tank was filled with water. If the school has 500 students and each student uses an average of 40 litres of water per day, determine the number of days the student s would use the water. (2 marks)
10. In Bomet country, a tailor bought a number of suits at a cost of sh 57,600 from wholesaler. Had he bought the same number of suits from a supermarket, it would have cost him sh 480 less per unit. This would have enabled him to buy four extra suits for the same amount of money.
11. Find the number of suits the tailor bought. (7 marks)
12. The tailor later sold each suit for sh 720 more than he paid for it. Determine the percentage profit he made. (3 marks)
13. A triangle BC with vertices A A(-4,2), B(-6,6) and C(-6,2) undergoes enlargement scale factor -1 and centre (-2,6) to produce triangle AIBICI.
14. On the grid provided draw triangle ABC and its image AIBICI, state the co-ordinates of ∆AIBICI (4 marks)



1. Triangle AIBICI is the reflected in the line y+x to give AIIBIICII. Draw triangle AIIBIICII and state the co-ordinates of its vertices. (3 marks)
2. If triangle AIIBIICII is mapped onto a triangle whose co-ordinates are AIII (-4,-2), BIII (-6,-6) and CIII (-6,-2) by a rotation, find the centre and angle of rotation. (3 marks)
3. The figure below shows a piece of land ABC not drawn to scale. Angle BDC is obtuse.

 A

 4m

 4m D

B 5m 30o C

 Calculate correct to 2 decimal places

1. Angle BC (3 marks)
2. Length AD (3 marks)
3. Length DC (2 marks)
4. Area of triangle ABC (2 marks)
5. The following measurements were recorded in a field book of a farm in metres

(xy = 400m)

|  |  |  |
| --- | --- | --- |
| C60B100A120 | Y40034030024022014080X | 120D100E160F |

1. Using a scale of 1cm representing 40m draw an accurate map of the farm. (4 marks)
2. If the farm is on sale at Ksh 80,000.00 per hectare, find how much it costs. (6 marks)
3. A trader bought 5 shirts and 2 trousers at a cost of sh 2400. If he had bought 2 shirts and 4 trousers, he would have spent sh.3200.
4. (i). Form two equations to represent the information above. (2 marks)

 (ii). Using matrix method find the cost of a shirt and a trouser. (4 marks)

1. If the trader bought 16 shirts and 20 trousers and sold them making a profit of 20% per shirt and 15% per trouser, find the percentage profit made on the total sale. (4 marks)