**Name……………………………………………….Adm No………..Class……**

**Index No………………………..** Signature…………………………

**121/1**

**Mathematics Paper 1**

**Form 4**

**2 ½ Hours**

**Term 2, 2018**

**KASSU JET EXAMINATIONS**

***Kenya Certificate of Secondary Education (K.C.S.E)***

**INSTRUCTIONS TO CANDIDATES**

* Write your name and Admission number in the spaces provided at the top of this page.
	+ This paper consists of two sections: Section I and Section II.
	+ Answer ***ALL*** questions from section I and ***ANY FIVE*** from section II
	+ All answers and workings must be written on the question paper in the spaces provided

beloweach question.

* + Show all the steps in your calculation, giving your answer at each stage in the spaces

below each question.

* + Non – Programmable silent electronic calculators and KNEC mathematical tables may be

used, except where stated otherwise.

**FOR EXAMINERS USE ONLY**

**SECTION I**

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

**SECTION II**

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

 **GRAND TOTAL**

**SECTION I 50 MARKS**

1. Without using tables, evaluate giving the answer in standard form. (3mks)
2. Find the value of t in the following equation (3mks)
3. Simplify the expression (3mks)

1. Evaluate using tables of reciprocals and cubes only expressing your answer to 4 significant figures

  (3mks)

1. Simplify; of 5 - 2 (3mks)

 + 1

1. Find the equation of a line which passes through the point (2, 3) and is perpendicular to

y = 3x -1. Giving your answer in the double intercepts form (3mks)

1. George received 1O,OOO Euros from his brother who stays in France .He sent to his sister who stays in Japan 10,000 Yen .In addition George bought a car worth sh.200,000. Exchange rates :

 **Buying Selling**

 1 Euro 73.4226 73.52953

100 Japanese yen 62.8011 62.8822

How much was left. (3marks).

1. Write down four inequalities which fully describe the unshaded region R in the figure S

below (4mks)

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1. A line PQ = 12.5cm. By using another line, divide PQ into nine equal parts. (3mks)
2. The sum of the interior angles of a polygon is 19800. Find the number of sides the polygon has. (3mks)

1. The diagram below is a sketch of a rice field (not drawn to scale), use it to generate a surveyor’s field book. (All measurements are in metres) (4mks)

 

1. A boy walk directly from point Q towards the foot of a vertical flag post 200m away. After conveying a distance of 140m, he observes the angle of elevation of the top of the flag post is 75. Calculate the angle of depression of point Q from the top of the flag post. (3mks)
2. Two similar blocks have masses of 729g and 216g respectively. If the surface area of the smaller block is 300cm2, calculate the surface area of the larger block. (3mks)
3. Using trapezoidal rule with 6 ordinates, find the area bounded by the curve y=2x3 – 5,

the x-axis and the lines x=2 and x=8. (3mks)

1. Kassim has a money box containing 100 mixed shs 5 and shs 10 coins with a total value of shs 600. How many of each type of coin does the box contain. (3mks)
2. The figure below shows a regular tetrahedron PQRS of edges 4cm.

Draw its net and measure the length of the straight path of PS through the midpoint T over the edge QR. (3mks)

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**SECTION II (50 MARKS)**

***(Answer ANY FIVE questions in the spaces provided)***

1. Complete the table below for the equation *y=2x2+2x-8* by filling the blank space. (2mks)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *x* | *-5* | *-4* | *-3* | *-2* | *-1* | *0* | *1* | *2* | *3* | *4* |
| *y* | ***32*** |  |  | ***-4*** |  | ***-8*** |  |  | ***16*** |  |

a). On the graph provided below, plot the graph of *y=2x2+2x-8.* (4mks)

(use the scale: y-axis=1unit, x-axis=1unit)



b) Use your graph to solve:

i) *2x2+2x-8=0 (1mk)*

*ii) 2x2+x+2=0 (3mks)*

1. a) a bus left Kisumu at 9.30 am towards Nairobi at an average speed of 81km/hr. A matatu left Nairobi for Kisumu at 10.10 a.m at an average speed of 72km/hr. The distance between Kisumu and Nairobi is 360km. Determine:

(i) The time taken before the two vehicles met. (3mks)

(ii) The distance between two vehicles 40 minutes after meeting. (2mks)

(iii) A car left Kisumu towards Nairobi at 9.50am at an average speed of 90km/hr. Determine the time the car caught up with the bus. (3mks)

(b) The figure below shows speed time graph of a journey. If total distance travelled in 80 seconds is 920m. Find the distance travelled in the final 40 seconds. (2mks)

 16m/s

speed

 0 15 time (seconds)

1. The Figure shows a frustum of a right pyramid open container for storing water.



Calculate:

1. The height of the pyramid from which the frustum was cut from. (2mks)
2. The surface area of the frustum (4mks)
3. The capacity of the frustum in litres (4mks)
4. The table below represent marks in percentage scored by 50 students in a class

|  |  |
| --- | --- |
| Marks | Frequency |
| 40-44 | 6 |
| 45-49 | 4 |
| 50-54 | 7 |
| 55-59 | 6 |
| 60-64 | 12 |
| 65-69 | 4 |
| 70-74 | 5 |
| 79-79 | 3 |
| 80-84 | 3 |

1. State the modal class (1mk)
2. Estimate:
3. The mean mark (2mks)
4. The median (3mks)
5. On the grid provided draw a frequency polygon to represent the above information. (4mks)
6. Given that the column vectors

Express as a column vector and hence calculate its magnitude (4mks)

b) Given that the midpoints of PQ is (-3,1) and Q (7,5), obtain the co-ordinates of P (3mks)

c) A translation T. maps triangle ABC onto triangle A1B1C1. Given the co-ordinates A(2,3) , B(2,5) and C(4,4). Find the co-ordinates of A1B1 and C1. (3mks)

1. The coordinates of triangle ABC are A(1, 1), B(3, 1) and C(1, 3).
2. Plot the triangle ABC. (1mk)
3. Triangle ABC undergoes a translation vector . Obtain the image of A’B’C’ under the transformation, write the coordinates of A’B’C. (2mks)
4. A’B’C undergoes a reflection along the line X=0, obtain the coordinates and plot on the graph points A”B”C” under the transformation. (2mks)
5. The triangle A”B”C” undergoes an enlargement scale factor -1, centre origin. Obtain the coordinates of the image A”’B”’C”’. (2mks)
6. The triangle A”’B”’C”’ undergoes a rotation centre (1, -2) angle 1200. Obtain the coordinates of the image A”B”C”. (2mks)
7. Which triangles are directly congruent? (1mk)

1. A particle moves along a straight line such that its displacement s metres from a given

point is s = t3 – 5t2 + 3t + 4 where t is time in seconds.

 Find:

 (a) The displacement of the particle at t = 8. ( 2 marks )

 (b) The velocity of the particle when t = 10. (3 marks )

 (c ) The values of t when the particle is momentarily at rest. ( 3 marks )

1. A pilot intends to fly from A to D through B and C, B is 750km from A and on a bearing of N50 40W from B and their distance apart is 600km. D is on a bearing of S 85 W from C and at a distance of 1050km.

a) Using the scale of 1cm for 100km, show the flight route. (4mks)

b) If the pilot on its way back decides to fly directly from D to A;

i) By use of compass bearing find the direction of A from D (1mk)

ii) Find the distance from D to A in kilometers. (1mk)

1. The plane flies at 500km/h. If it leaves D at 9.00a.m at what time did it arrive at A.(2mks)

d) i)Using your diagram in (a) above, (i) find the distance between A and C (1mk)

ii) Find the compass bearing of A from point C (1mk)