**NAME………………………………………………….….ADM. NO………………CLASS……………**

**DATE:………/……./ 2017**

**MWAKICAN JOINT EXAMINATION (MJET) – 2017)**

**END OF TERM 2 EXAM**

**FORM 2 MATHEMATICS**

**TIME: 2½ HRS.**

**INSTRUCTION TO STUDENTS:**

1. *Write your* ***name****,* ***admission number*** *and* ***class*** *in the spaces provided above.*
2. *Write the* ***date*** *of examination in spaces provided.*
3. *This paper consists of* ***two*** *Sections; Section* ***I*** *and Section* ***II****.*
4. *Answer* ***ALL*** *the questions in Section* ***I*** *and only* ***five*** *questions from Section* ***II****.*
5. *All answers and working must be written on the question paper in the spaces provided below each question.*
6. *Show all the steps in your calculation, giving your answer at each stage in the spaces provided* ***below*** *each question.*
7. *Marks may be given for correct working even if the answer is wrong.*
8. *KNEC Mathematical tables* ***may be*** *used, except where stated otherwise.*
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 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

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

**SECTION II**

**GRAND TOTAL**

|  |
| --- |
|  |

***Ensure that all the pages are printed and no question(s) are missing***

**ANSWER ALL THE QUESTIONS IN THE SPACES PROVIDED BELOW EACH QUESTION**

**SECTION 1(50 MARKS)**

1. Evaluate [3 Marks]
2. A matatu travelling at 64 Km/h takes 1 ¼ hours to move from town A to town B. Find the distance between towns A and B. [2 Marks]
3. Simplify the expression [1 Mark]

 Hence solve the equation

 [2 Marks]

1. Kamau and Korir together can do a piece of work in 6 days. Kamau working alone takes 5 days more than Korir. How many days does it take Korir to do the work alone. [4 Marks]
2. The interior angles of the hexagon are Find the value of the smallest angle. [3 Marks]
3. The mass of a solid cone of radius 14cm and height 18cm is 4.62kg and its density in g/cm3 [3 Marks]
4. The diagonals of a rhombus measure 9.2 cm and 7.5 cm respectively. Calculate the area of the rhombus [3 Marks]
5. Evaluate [3 Marks]
6. A man is three times as old as his daughter. In twelve years’ time he will be twice as old as his daughter. Find their present ages. [3 Marks]
7. A minor arc of a circle subtends an angle of 1350 at the centre of the circle. If the radius of the circle is 8.4cm. Find the length of the major arc. ()

[3 Marks]

1. A line *L* passes through point (3, 1) and is perpendicular to the line

. Determine the equation of line L. [3 Marks]

1. A shirt whose marked price is 800 is sold to a customer after allowing him a discount of 13%. If the trader makes a profit of 20%. Find how much the trader paid for the shirt. [3 Marks]
2. Use logarithms, correct to 4 decimal places, to evaluate [4 Marks]
3. A Kenyan bank buys and sells foreign currencies as shown below

 Buying Selling

 (In Kenya shillings) In Kenya Shillings

1 Hong Kong dollar 9.74 9.77

1 South African rand 12.03 12.11

A tourists arrived in Kenya with 105 000 Hong Kong dollars and changed the whole amount to Kenyan shillings. While in Kenya, she pent Kshs 403 897, and changed the balance to South African rand before leaving for South Africa. Calculate the amount, in South African rand that she received. [3 Marks]

1. A tailor had a piece of cloth in the shape of a trapezium. The perpendicular distance between the two parallel edges was 30cm. the lengths of the two parallel edges were 36 cm and 60cm. the tailor cut of a semi-circular piece of cloth of radius 14cm from the 60cm edge. Calculate the area of the remaining piece of cloth. (Take ) [4 Marks]
2. In a fundraising committee of 45 people, the ratio of men to women is 7:2. Find the number of women required to join the existing committee so that the ratio of men to women is changed to 5:4. [3 Marks]

**SECTION II (50 Marks)**

*Answer only five questions in this section in the spaces provided.*

1. Three partners Amina, Bosire and Karuri contributed aa total of Kshs. 4,800,000 in the ratio 4:5:7 to buy an 8 hectares piece of land. The partners set aside ¼ of the land for social amenities and subdivided the rest into 15m by 25m plots.
2. Find:
3. The amount of money contributed by Karuri. [2 Marks]
4. The number of plots that were obtained. [3 Marks]
5. The partners sold the plots at Kshs. 50,000 each, spent 30% of the profit realized to pay for the administrative costs. They shared the rest of the profit in the ratio of their contributions.
6. Calculate the net profit realized. [3 Marks]
7. Find the difference in the amount of the profit earned by Amina and Bosire.

 [2 Marks]

1. (a) On the grid provided draw the square whose vertices are A(6, -2), B (7, -2), C (7,-1)and D ( 6, -1) . [1 Mark]



(b) On the same grid draw

* 1. A1B1C1D1 the image of ABCD, under an enlargement scale factor 3, centre(9,-4). [3 Marks]
	2. A11B11C11D11, the image A1B1C1D1 under a reflection in the line x = 0.

 [2 Marks]

* 1. A111B111C111D111, the image of A11B11C11D11 under a rotation of +900 about the origin. [4Marks]

1. A saleswoman is paid a commission of 20% 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.

a) Calculate the saleswoman’s earnings that month. [3 Marks]

b) 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. [5 Marks]
	2. The number of handbags sold that month [2 Marks]
1. The following measurements were recorded in a field book at a farm using XY = 400m as the baseline.

|  |  |  |
| --- | --- | --- |
|  | Y |  |
| C 60B 100A 120 | 34030024020014080 | 120 D100 E 160 F |
|  | X |  |

1. Using the scale of 1:4000(1cm represents 40m) draw accurately the map of the farm. [4 Marks]

1. Determine the actual area of the farm in hectares. [4 Marks]
2. If the farm is on a sale at Ksh. 80 000 per hectare, how much does the farm the farm costs. [2 Marks]
3. The figure below represents a cone of height 12 cm and base radius of 9 cm from which a similar smaller cone is removed, leaving a conical hole of height 4 cm.



1. Calculate:
2. the base radius of conical hole; [2 Marks]
3. the volume, in terms of, of the smaller cone that wasremoved.

 [2 Marks]

1. (i) Determine slant height of the original cone [1 Mark]

 (ii) Calculate, in term of, the surface area of the remaining solid after the smaller cone is removed [5 Marks]

1. The diagram below represents a rectangular swimming pool 25m long and 10m wide. The sides of the pool are vertical.

2.8 m

10 m

25 m

1m

 The floor of the slants uniformly such that the depth of the shallow end is 1m and at the deep end is 2.8m.

1. Calculate the volume of the water required to completely fill the pool. [4 Marks]
2. Water is allowed into the empty pool at a constant rate through an inlet pipe. It takes 9 hours for the water to just cover the entire floor of the pool. Calculate:
3. The volume of the water that covers the floor of the pool. [3 Marks]
4. The time needed to completely fill the remaining part of the pool.[3 Marks]
5. a. A straight line L1 whose equation is meets at R.

Determine the coordinates of R [2 Marks]

1. A second line L2 is perpendicular to L1 at R

Find the equation of L2 in the form where and are constants

 [3 Marks]

1. A third line L3 passes through (-4,1) and is parallel to 4. Find
2. the equation of L3 in the form where and are constants [2 Marks]
3. The coordinates of point S, at which L3 intersects L2. [3 Marks]
4. Three towns P, Q and R are such that P is on a bearing of 120˚ and 20km from Q.Town R is on a bearing of 220˚ and 12km from Q.
5. Using a suitable scale, draw the position of P, Q and R. [4 Marks]
6. Find:
7. The distance between P and R in kilometers [2 Marks]
8. The bearing of R from P [1 Mark]
9. The bearing P from R [1 Mark]
10. The bearing of Q from P [1 Mark]
11. The bearing of Q from R [1 Mark]