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

**DATE:………/……./ 2015**

**MWAKICAN JOINT EXAMINATION (MJET) – 2015)**

**END OF TERM 1 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***

**SECTION 1 (50 marks)**

*Answer all the questions in this .section in the spaces provided.*

1. Without using a calculator, evaluate;

 $\frac{2\frac{1}{5} +\frac{2}{3 } of 3\frac{3}{4} - 4\frac{1}{6}}{1\frac{1}{4} -2\frac{2}{3} ÷ 1\frac{1}{3} + 3\frac{3}{4}}$ (3 marks)

2. Use logarithms, correct to 4 decimal places, to evaluate $\frac{\sqrt[3]{83.46×0.0054}}{1.56^{2}}$ (4 marks)

1. Use reciprocal tables to work out

 $\frac{17}{0.051}+\frac{3}{0.0027}$ (3mks)

**4.** Solve for x in 4*x*-1 = 32 (3 marks)

5. The size of an interior angle of a regular polygon is 3x0 while its exterior angle is (x- 20)0. Find the number of sides of the polygon (3 marks)

6. The marked price of a car in a dealer’s shop was Kshs 400,000. Wekesa bought the car at 8% discount. The dealer still made a profit of 15%.

Calculate the amount of money the dealer had paid for the car. (3mks)

1. The diagram below represents a prism of length 20cm whose cross-section is an equilateral triangle of sides 4cm. Draw a well labeled sketch of the net of the prism. (3mks)

B

E

D

F

A

4 cm

20cm

C

1. Find the angles marked a, b and c in the diagram. (3mks)

b

c

63°

a

50°

1. In this question, mathematical table should not be used

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)

**10.** Using a pair of compass and a ruler only.

1. Construct a triangle ABC such that AB = 6cm, BC = 8cm and <ABC = 135o. (2mks)
2. Construct the height of triangle ABC in (a) above taking BC as the base and measure the height. 2mks
3. A fruit vendor bought 1948 oranges on a Thursday and sold 750 of them on the same day. On Friday, he sold 240 more oranges than on Thursday. On Saturday he bought 560 more oranges. Later that day, he sold all the oranges he had at a p[rice of Ksh 8 each.

Calculate the amount of money the vendor obtained from the sales of Saturday. (3mks)

**12.** Without using mathematical tables or calculator, evaluate

 $\frac{\sqrt{5184}}{6 ×(-18) ÷9+(5—3)}$ 3 mks

**13**. Solve the following simultaneous equations

$$4x+3y=18$$

$5x-2y=11$ (3mks)

14 Three bells ring at intervals of 9 minutes, 15 minutes and 21 minutes. The bells will next ring together at 11:00 pm. Find the time the bells had last rang together. (3 marks)

15. A line L passes through point (3, 1) and is perpendicular to the line 2y = 4x + 5.

 Determine the equation of line L in the form y = mx+c. (3 marks)

16. Work out the following:

1. ($x^{4}$) 2$×x^{2}$ (2mks)
2. $y^{21}÷y^{14}$ (1mk)

**SECTION II (50 marks)**

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

 17. The vertices of quadrilateral OPQR are O (0, 0), P (2, 0), Q (4, 2) and R (0, 3). The vertices of its image under a rotation are O’ (1, -1), P’ (1,-3), Q’ (3, - 5) and R’ (4, - 1).

 (a) (i) on the grid provided, draw OPQR and its image O’P’Q’R’. (2 marks)



(ii) By construction, determine the centre and angle of rotation. (3 marks)

(b) On the same grid as (a) (i) above, draw O” P”Q”R”, the image of Q’P’Q’R’ under a reflection in the line y = x. (2 marks)

(c) From the quadrilaterals drawn, state the pairs which are:

(i) Directly congruent; (1 mark)

(ii) Oppositely congruent. (2 marks)

18. Town B is 40m from town A on a bearing of 042o. Town C is 32km from town A on a bearing of 350o. Another town D is 21 km from town A on a bearing of 200o.

1. By means of scale drawing show the position of town A,B ,C and D. (use a scale of 1cm rep. 5km) 6mks
2. Use the diagram in (a) above to determine;
3. The distance C from B. 1mk
4. The bearing of C from D. 1mk
5. The distance of B from D 1mk

19. Three business partners Kamau, Tatua and Makau contributed Ksh. 100 000, Ksh. 80 000 and Ksh. 50 000 respectively to start a business. After one year the business realized a profit which they shared in the ratio of their contribution.

1. If Makau’s share of profit sh. 20 000 how much was the total amount of profit?

3mks.

1. At the beginning of the second year Makau boosted his shares by sh. 10 000. If the business profit was increased by 20% at the end of the second year. Calculate:
2. Kamau’s share of the profit. 4mks.
3. The difference between Kamau’s share and Tatua’s share of profit. (3mks)
4. A salesman received a basic salary of sh.50, 000 a year together with a commission of 6% on the value of goods sold and a car allowance of sh2.50 per km.
5. Find the total amount he received in a year in which he sells goods worth sh.625, 000 and travels 10,000km. (4mks)

1. The next year he travels 12,000km and receives a total of sh.134,000
2. Calculate the value of goods sold (4mks)
3. Calculate the percentage increase in the value of goods sold (2mks)

21. 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. 4mks

1. Determine the actual area of the farm in hectares. 4mks
2. If the farm is on a sale at Ksh. 80 000 per hectare, how much does the farm the farm costs.2mks.
3. 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. 4mks
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. (3mks)
4. The time needed to completely fill the remaining part of the pool. (3mks)

23. a) Use the figure below to answer the questions that follow.

D

C

B

A

6cmm

10cm

4cm

 Find:

1. The area of triangle ABC ( 2mks)
2. The length of the perpendicular from B to AC.(2mks)
3. PQRS is a trapezium with area 88.2 cm2 .PQ is parallel to RS. If PQ=9.4 cm and the distance between PQ and RS is 6.3 cm, find the length of RS. (3mks)
4. The diagonals of a rhombus are 16cm and 12cm long. Given that the diagonals of a rhombus meet at right angles and bisect each other, calculate the area of the rhombus.(3mks)

24. In a science experiment, a coil spring is fixed at one end, and different weights are hung from the other end. The length of the spring is measured each time a new weight is hung on it. The measurements are shown in the table below.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Weight (g) | 0 | 5 | 10 | 15 | 20 | 25 | 30 |
| Length of the spring (cm) | 30.2 | 40.3 | 50.1 | 59.5 | 70.0 | 80.4 | 90.2 |

1. Round off the length of the spring to the nearest whole number. (2mks)
2. Using a suitable scale plot a graph of weight against length on the grid provided.(4mks)



1. Find the length of the spring if the weight was
2. 8g ii) 26g (2mks)
3. What weight corresponds to
4. 36cm ii) 86cm (2mks)