**KUHS: FORM 3 – MID TERM EXAM**

**MATHEMATICS TERM 2 2013**

**TIME: 2.30**

**SECTION I (50 MARKS)**

**ANSWER ALL QUESTIONS IN THIS SECTION**

1. Use mathematical tables to evaluate (3 marks)

√0.2893 x 64.43

 8.933

1. Rationalize the denominator of (3 marks)

√3 – 2√ 2

√3 +√ 2

1. The scale of a map is 1: 200,000. Calculate
2. The actual distance in KM between two points A and B, 5 cm apart. (1 mark)
3. The actual area of a triangular field whose sides are 5cm apart. (3 mark)
4. In the figure below, OC is a diameter angle DEC = 30, angle ACB = 52, angle CAE = 54.

 Determine

1. Angle EDC (1 mark)
2. Angle DCE (1 mark)

(c) angle ADE (1 mark)

1. Find the value of x in

Log10(2x-1) + log 10 3 - log 10(8x+1) = 0 (3 marks)

1. The sides of a rectangle are given as 4.5 cm and 2.5 cm. calculate the percentage error in the calculate in of the area of the rectangle (3 marks)
2. Find the equation of the line passing through the points (1,3) and 3,7) (3 marks)
3. Use a ruler and a pair of compasses only to construct an obtuse angled triangle ABC such that AB = 6cm, CA = 4cm and angle ABC = 30o  measure BC (3 marks)
4. Find the interest on sh 10,000 for one year at 6% p.a. if interest is compounded monthly (4 marks)
5. Use the substitution y = 2x to solve 22x+3 – 6(2x) + 1 = 0 (4 marks)
6. 0.8756 (2d.p.) (1 mark)

(ii) 3.0099 (3 d.p.) (1 mark)

1. Round off the following numbers to the significant figures indicated:
2. 45.985 (3 s.f.) (1 mark)

.00

1. 0.50.
2. .895 (3s.f.) (1 mark)
3. The radii of the sectors OAB and OKL shown in the figure below are 10cm and 7cm respectively. Angle OB = 40o. Find tarea of the shaded region. (take ∏ = 3.142) (3 marks)
4. Simplify completely (3 marks)

15x y –10x2

27y2 – 12x2

1. Use the quadratic formula to solve the equation

3x2+7x + 2 = 0

1. Evaluate
2. Find the least quantity on tea leaves that can be divided into equal amounts of 20kg or 30 kg, or 40kg (2 marks)

**SECTION II (50 marks)**

**Answer all questions in this section**

Total income p.a rate in Ksh

In K£ per £

1 – 3200 2

3201 – 6400 3

6401 -9600 5

9601 – 12800 6

12800 and above 7

Njuguna earned a salary of Ksh 1600 per month. In addition, he has given a house allowance of Ksh 600/- and a medical allowance of Ksh 2000/- per month. He got a family relief of Ksh 800/- per month. How much income tax did he pay per month? (10 marks)

1. a) Draw the graph of y=x2+4x+1 for -4 ≤x ≤ 2

(b) On the same axes draw the line y=3x =2

1. Use your graph to solve the equations
2. X2-4x+1 = 0
3. X2+x-1 = 0

19. A saleswoman is paid a commission of 2% 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 Kshs 500/- each

(a) Calculate the :-

(i) Saleswoman’s earnings that month. (3 marks)

1. Acute angle between the edges AB and BC (3 marks)
2. A water tap is to be installed inside the plot such that the tap is equidistant from each of the vertices A, B and C. Calculate the distance of the tap from vertex A. (3 marks)

21. (a) A certain sum of money is deposited in a bank that pays simple interest at a certain rate. After 3 years the total amount of money in the account is shs 358,400. The interest earned each year is sh 12,800/-

Calculate:

(i) the amount of money which was deposited. (2 marks)

1. The annual rate of interest that the bank paid. (2 marks)

(b)A computer whose marked price is sh 40,000 is sold at shs 56,000/- on hire purchase terms.

(i) Kioko bought the computer on hire purchase terms. He paid a deposit of 255 of he hire purchase price and cleared the balance by equal monthly installment of 2625/-. Calculate the number of installments. (3 marks)

1. That Kioko bought the computer on cash price terms he would have been allowed a discount of 12$\frac{1}{2}$% on marked price.

Calculate the difference between the cash price and hire purchase price and express it as a percentage of the cash price. (3 marks)