**KAHUHO UHURU HIGH SCHOOL**

**FORM 3 MATHEMATICS**

**TERM II 2014**

**MID TERM EXAMS**

**TIME 2.30 HOURS**

**INSTRUCTIONS: ANSWER ALL THE QUESTIONS IN SECTION A AND AND FIVE IN SECTIN II**

1. The L.C.M. and G.C.D. of three numbers is 300 and 10 respectively. Two of the numbers are 100 and 60,. Find all the possible numbers which could represent the third number. (3 marks)
2. Simplify completely (3 marks)
3. The measurements of a rectangle were given as 5.1cm and 6.0cm correct to 2 significant figures. Find the percentage error in its area. (3 marks)
4. The line whose equation is 3x – 2y = 6 cuts the x and y axes at P and Q respectively find the co-ordinates of P and Q. Calculate the gradient of this line. (3 marks)
5. Find the volume of the given pyramid. (3 marks)

1. A man invests Ksh 10,000 in an account which pays 16% interest p.a. the interest is compounded quarterly. Find the interest earned after 1$\frac{1}{2}$ years to the nearest shillings. (3 marks)
2. Given that Tan0= and is an acute angle, find without using tables or calculators, sin (90 -0), leaving your answer in simplified surd form. (3 marks)
3. Construct two tangents to the circle, centre O from point x. (3 marks)
4. A sphere has a surface area of 18cm2. Find its density if the sphere has amass of 100g. (3 marks)
5. Given that A= and B = Find the matrix C for which A2 +2B = C (3 marks)
6. In the given figure, AT is a tangent to the circle at A. angle ATB = 480, BC = 5cm and CT = 4cm.
7. Calculate the length AT (2 marks)

1. Calculate length AB (2 marks)
2. Find the value of K that makes the expression

4x2+ 20x+5+K a perfect square. (3 marks)

1. A two digit number is such that the product of the digits is 24. When the digits are reversed the number formed is greater that the original number by 18. Find the number (4 marks)
2. Solve the equation log10(6x-2) -1 = log10(x-3) (3 marks)
3. Use the matrix method to solve the simultaneous equations (3 marks)

4x+3y =18

-2y+5x=11

1. Find the value of x in the given equation (3 marks)

49x+1 +72x +350

**SECTION II (ANSWER ANY FIVE (5) QUESTIONS)**

1. The cash price of a laptop was Ksh 60,000/- on hire purchase terms, a deposit of Ksh 7500 was paid followed by 11 monthly installments of Ksh 6,000 each.
2. Calculate
3. The cost of a laptop on hire purchase terms. (2 marks)
4. The percentage increase of hire purchase preice compared to the cash price. (2 mrks)
5. An institution was offered a 5% discount when purchasing 25 such laptops on such terms. Calculate the amount of money paid by the institution. (2 marks)
6. Two other institutions x and Y bought 25 such laptops each. Institution x bought the laptops on hire purchase terms. Institution Y bought the laptops on cash terms with no discount b securing a loan form a bank. The bank charges 12% p.a. compound interest for two years. Calculate how much money institution Y paid more than institution x. (4 marks)

 Given that AC = 9.5 cm. BC = 10.3cm and angle BAC = 57o . Find:

1. Angle ABC (2 marks)
2. Length AB (2 marks)
3. The radius of the circle. (1 mark)
4. The area of triangle BC (2 mark)
5. The area of the circle. (2 marks)
6. The shaded area. (1 mark)
7. The table below gives Kenya tax rates in 2013

|  |  |
| --- | --- |
| Income in K p.m. | Rate of tax in percentage |
| First 484 | 10% |
| Next 456 | 15% |
| Next 456 | 20% |
| Next 456 | 25% |
| Over 1853 | 30% |

Ms Kambo earned a salary of Ksh 13500 per month, she also got a house allowance of ksh 6,000 and a medical allowance of kshs 1200 p.m. She was entitled to a monthly tax relief of Ksh 960.

1. Calculate ms Kambo’s monthly taxable income in K pounds (2 marks)
2. Calculate the monthly income tax she paid. (4 marks)
3. What percentage of her income went to the income tax to 2.d.p. (2 marks)
4. In addition to tax. Ms Kambo had t he following other monthly deductions: NHIF = Ksh 3000, co-operative savings = Kshs 2000/- and a loan repayment of ksh 400. Calculate ms kombo’s net monthly income in ksh. (2 marks)
5. The diagram below (not drawn to scale) represents the cross-section of a solid prism of height 8cm.
6. Calculate the volume of the prism. (3 marks)
7. Given that the density of the prism is 5.75g/cm3, calculate its mass in grams. (2 marks)
8. A second prism is similar to the first one but is made of a different material. He volume of the second prism is 246.24cm3.
9. Calculate the area of the cross-section of the second prism. (3 marks)
10. Given that the ratio of the mass of the first prism to that of the second is 2:5, find the density of the second prism. (2 marks)

21.

Two pulleys of radii 21cm and 14cm have their centres at A and B, 45cm apart. A tight belt runs all round the pulleys as shown in the diagram above.

1. The length BN. (2 marks)
2. Angle BAP (2 marks)
3. The length of the belt in contact with the pulley centre A. (2 marks)
4. The length of the belt in contact with the pulley centre B. (2marks)
5. The total length of the belt. (2 marks)
6. A School with n students planned to purchase a van costing Ksh 2,000,000. It was decided that each student had to contribute an equal amount to meet the cost of the van.

Forty students left the school before contributing. Then each of the remaining students had to contribute Ksh 25000 more.

1. Form an equation in n and hence find the number of students who were in the school at the beginning. (5 marks)
2. Before the students made their contribution, the are MP agreed to pay for 30% of the cost of the bus. Calculate the amount each student contributed. (3 marks)
3. The students’ contribution consisted of the amount they received from members of the public and from their parents. These amounts were in the ratio 5:17. Calculat3e the total amount the students received from their parents. (2 marks)
4. In the figure below, o is the centre of the circle, angle AEB = 500 angle EBC = 800 and angle ECD = 300 giving reasons, calculate
5. Angle CDE (3 marks)
6. Angle DFE (3 marks)
7. Obtuse angle CDE (2 marks)
8. Angle ADE (2 marks)