

**W1-2-60-1-6**

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2015/2016**

**SPECIAL/SUPPLEMENTARY YEAR I SEMESTER I EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN MATHEMATICS AND COMPUTER SCIENCE**

**SMA 2104: MATHEMATICS FOR SCIENCE/BUSINESS**

**DATE:DECEMBER 2015 TIME: 2 HOURS**

**INSRUCTIONS:** Answer question one and any other two questions.

QUESTION ONE

a. Determine the nature of the roots of the equations below.

 i. 476x+289=-196x2 (2 marks)

 ii. 10x2+30x+4=0 (2 marks)

 iii. 8+6x2=13x (2 marks)

b. Three ?? x, yz participate in a shooting contest. Their probabilities of hitting the target are 1/3 1/7 and 1/9 negatively. Find the probability that the target will be hit by one bullet. (4 marks)

c. Without using tables/calculations evaluate.

 i. sin 1050 (3 marks)

 ii. cost 2550 (3 marks)

d. Solve the simultaneous equations

 xy=160

 log x-3logy=1

 for x>0,y>0 (4 marks)

e. Find using first principles the sum of the first 8 terms, s8 of the common ratio ½

 (6 marks)

f. Simplify

  (4 marks)

QUESTION TWO (20 MARKS)

Calculate the mean and the standard deviation of the distribution given below using the variance formula.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Length | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 |
| Frequency | 5 | 12 | 25 | 11 | 7 |

b. Factorize the expression 6x3-17x2, 4x+3=0 (4 marks)

c. A customer makes a simple deposit of sh 18000 in an account which pays compound interest at a rate of 8% per annum.

 i. How much is the investment worth after 12 years. (4 marks)

 ii. After how many years will the investment be worth three times its initial value.

 (4 marks)

QUESTION THREE (20 MARKS)

a. Solve the equations

 log2(x+2) + Log2(x-2)=5

 for x>0 (5 marks)

b Find the term containing x3 in the expansion of (2x-y)50 and simplify your answer.

 (6 marks)

c. Find the interquartile range for the data.

 3,10,7,11,23,5,9 (4 marks)

d. A rational number is a number which can be expressed in the form p/q where p and q are integers and q=0. Move by contradiction that $\sqrt{2}$ is irrational. (5 marks)

QUESTION FOUR (20 MARKS)

a. i. State and proof the remainder theorem. (6 marks)

 ii. Find the remainder when the function f(x) defined by f(x)=6x6-2x3+3x2-3 is divided by

 i. x-2 (2 marks)

 ii. x+3 (2 marks)

 iii. 2x+1 (2 marks)

b. In an A.P the 4th term is 13 and the 7th term is 22.

Determine

 i. The first term and the common difference. (4 marks)

 ii. The value of n if n the term is 100. (4 marks)