

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

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2014/2015**

**YEAR I SEMESTER I EXAMINATION FOR DEGREE OF BACHELOR OF ACTURIAL SCIENCE**

**SMA 2104: MATHS FOR SCIENCE**

**DATE:DECEMBER 2014 TIME: 2 HOURS**

**INSTRUCTIONS:** Answer question one and any other two.

QUESTION ONE (30 MARKS)

a. State the remainders theorem. (2 marks)

b. i. Factorize the expression 6x3-17x2-4x+3

ii. Hence solve the cubic equation 6x3-17x2=4x+3=0 (6 marks)

c. Use pascals triangle to simplify the expression below, leaving surds in the answer.

 (6 marks)

d. i. Write the first three terms in the expansion in ascending power of x of

(3-2x)8

ii. Hence evaluate (2.98)8 correct to 3.dp. (6 marks)

e. Find the value of log4 54 (3 marks)

f. A fair coin is tossed and unbiased die is thrown at the same time. Find the probability of observing a Head or a b. (2 marks)

g. The 3rd term of a G.P is 2 and the 5th term is 16. Find

i. Common ratio and first term. (3 marks)

ii. Sum of the 1st 6 terms. (2 marks)

QUESTION TW0 (20 MARKS)

a. If a single deposit of sh 150000 is invested for three years at compound interest at what rate will the investment be worth sh 182326. (4 marks)

b. Find the value of m if 25x2-70x-19+m is a perfect square. ( 4 marks)

c. Show that loguV= (5 marks)

d. In a hockey a march can be won drawn or lost. If a team plays five matches, how many different sequence of results are possible. (3 marks)

e. Find the mean, median, and the mode for the following data.

94, 102, 104, 102, 92, 96, 112, 108, 110, 114, 96, 96. (4 marks)

QUESTION THREE (20 MARKS)

a. A formulae for finding the durability of a fibre cable is ak2+2b(k-c)=0. Solve the equation for k when a=16, b=40, c=8. (5 marks)

b. i. Draw the graph of the function

f(x)=x2-3x+2, for -1≤x≤4. (3 marks)

ii. From your graph find the roots of

a. x2=3x+2=0 (2 marks)

b. x2=4x=0 (4 marks)

c. Use the method of completion the square to find the roots of the quadratic equation.

3x2-4x-5=0 (6 marks)

QUESTION FOUR (20 MARKS)

a. Prove that Cosec2 θ=1+co+2 θ (4 marks)

b. Solve the equation 12 cos2 θ + sin θ=11 on the domain 0≤θ≤=3600.

(7 marks)

c. Determine in radiant the general solution of the equation.

sec θ=10 sec θ (5 marks)

d. By use of trigometrics identities show that

 = tan θ+cot θ (4 marks)