**JOMO KENYATTA UNIVERSITY**

**OF**

**AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2014/2015**

**FIRST YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN MATHEMATICS AND COMPUTER SCIENCE/ BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY/**

**BACHELOR OF SCIENCE IN ACTUARIAL SCIENCE**

**SMA 2104: MATHEMATICS FOR SCIENCES**

**DATE: AUGUST 2015 TIME: 2 HOURS**

**INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS**

**QUESTION ONE (30 MARKS)**

1. Rationalize the denominators of the following hence, simplify: [6 marks]
2. 
3. 
4. i) Given that  = 5.9160798

 Evaluated without using tables or a calculator

 [4 marks]

ii) Solves (2x)3 = 212 [2 marks]

iii) Simplify log 100 - 2log50 [4 marks]

1. i) Use Binomial theorem to evaluate (1.002)5 correct t0 6 d.p [5 marks]

ii) Calculate the mean, and standard deviation of the

 measurements:

 2.29, 2.36, 2.31, 2.39, 2.33, 2.25 [5 marks]

1. A bag contains 5 red balls, and 7 white balls. Find the

probability of drawing 2 white balls in two draws such that:

1. The balls drawn not being replaced
2. The balls drawn being replaced after each draw

 [4 marks]

**QUESTION TWO (20 MARKS)**

1. Solve Log5x = 16logx5 [10 marks]
2. The roots of the equation 2x2 – 4x + 1 = 0 are 

Find an equation with integral co-efficient whose roots

are  [10 marks]

**QUESTION THREE (20 MARKS)**

1. In an arithmetic progression, the sum of the first five terms

is 30, and the third term is equal to the sum of the first two

terms. Write down the first five terms of the progression. [10 marks]

1. i) Write down the term 12th term in the supansion of

 (2 – x)15

ii) Write down the term containing x4 in the binomial

 expansion of (1 – 2x)12 [10 marks]

**QUESTION FOUR (20 MARKS)**

1. Solved Sin2x + sinx – 1 = 0, 0  [10 marks]
2. Write 3$\cos(θ)$ + 4sin $θ$ in the form R cos ($θ$ - , hence

solve the equation, 3$\cos(θ)$ + 4sin $θ$ -2 = 0 [10 marks]