JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

# **UNIVERSITY EXAMINATIONS 2014/2015**

FIRST YEAR SECOND SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN MATHEMATICS AND COMPUTER SCIENCE

**SMA 2102 : CALCULUS II**

**DATE: APRIL 2015 TIME: 2 HOURS**

**INSTRUCTIONS:**

**ANSWER QUESTION ONE [COMPULSORY] AND ANY OTHER TWO QUESTIONS**

**====================================================================**

**QUESTION ONE [30 MARKS]- COMPULSORY**

1. Show that  [3 marks]
2. If  then show that  [3 marks]
3. Use any appropriate integration technique to find
4.  [4 marks]
5.  [5 marks]
6.  [5 marks]
7.  [5 marks]
8. Find the length of a curve   (where C is a constant) between A(0,0) and B(x,y) [5 marks]

**QUESTION TWO [20 MARKS]**

1. Differentiate the differential coefficient of  [4 marks]
2. Evaluate the following definite integral correct to 4 s.f.

 [6 marks]

Using  substitution, determine  [6 marks]

(ii) hence determine  [4 marks]

**QUESTION THREE [20 MARKS]**

1. Find the modulus and argument of z = 4-3i hence write this number in Euler’s form. [5 marks]
2. State and prove De’moivres theorem. [4 marks]
3. Find all the fourth roots of z=3+4i and plot them on a complex plane. [8 marks]
4. Write  in the form z=a+ib [3 marks]

**QUESTION FOUR [20 MARKS]**

1. Solve  [4 marks]
2. Find the length of length curve of the parabola y2 = x3 between A(0.0) and B(1,1). [6 marks]
3. Find the area of the surface generated by the complete rotation about the x-axix of the position of a curve  between x=0 and x=1 [6 marks]
4. Evaluate  using symposium rule with 4 intervals. [4 marks]