**JOMO KENYATTA UNIVERSITY**

**OF**

**AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2015/2016**

**END OF SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF**

**SCIENCE IN HORTICULTURE/AGRICULTURE ENGINEERING AND**

**ENGINEERING**

**SMA 2161: MATHEMATICS II**

**DATE: APRIL 2016 TIME: 2 HOURS**

**INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS.ALL THE NECESSARY WORKINGS MUST BE CLEARLY SHOWN**

**QUESTION ONE (30 MARKS)**

1. If f(x)=3x + 5 and g(x) = 5 – 7x,find F(x)=f(g(x) and G(x)=g(f(x) (4 marks)
2. Given that y=, find from the first principles. (5marks)
3. Differentiate the following with respect to x
4. X2  (2 marks)
5. X3loge(x2- 5) (3 marks)
6. Find the equation of the tangent to the curve y3 +3y =x2  at the point (2,1) (5 marks)
7. The distance xm which a body travels in time t seconds is given by x=5+6t+4t2 Find the velocity and the acceleration of the body after 3 seconds. (4 marks)
8. Evaluate the following integrals
9. )2dx (2 marks)
10. ) d (2 marks)
11. Sketch the curve y=x2 -2x from x=-1 to x=3. Hence find the area enclosed by the curve and the x-axis. (5 marks)

**QUESTION TWO (20 MARKS)**

1. Find the maximum and the minimum values of the function y=12logex – x2 + 2x (2 marks)
2. Find if;
3. Y= x (5 marks)

x2- 1

ii) y=(1 – x) (5 marks)

**QUESTION THREE (20 MARKS)**

1. Evaluate the following;
2. 4  (3 marks)
3. dx (3 marks)
4. Using the substitution x=2 sin evaluate (5 marks)
5. Find the area between the curve y=6x – x2 and the x-axis. Find also the volume generated when this area is rotated through 360o about the x-axis (9 marks)

**QUESTION FOUR (20 MARKS)**

1. Find the turning point of the curve y= x3 +x2 –x +1 and distinguish between them. (7 marks)
2. Find the equation of the normal to the curve 4x2 + 9y2 =72 at the point (3,2) (6 marks)
3. A curve is represented in the parametric form by the equation x=t, and y=. Find the equation of the tangent and normal at the point where t=. (7 marks)