

# MAASAI MARA UNIVERSITY

# REGULAR UNIVERSITY EXAMINATIONS 2018/2019 ACADEMIC YEAR FIRST YEAR SECOND SEMESTER

## SCHOOL OF SCIENCE BACHELOR OF SCIENCE AND BACHELOR OF EDUCATION

# COURSE CODE: MAT 1207 COURSE TITLE: INTEGRAL CALCULUS

DATE: 16<sup>TH</sup> APRIL 2019 1100 - 1300 HRS TIME:

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#### **INSTRUCTIONS TO CANDIDATES**

- 1. Answer Question **ONE** and any other **two** questions.
- 2. All Examination Rules Apply.

#### **Question One**

a) Find

i.)	$\oint_{1}^{x^{2}+3x-2} \frac{dx}{\sqrt{x}} dx$	(3
	marks)	

ii.) 
$$(3)^{5} + 3(x-1)^{2} + 5 dx$$

marks)  
iii.) 
$$\sqrt[m]{n x^2 dx}$$
 (3)

iv.) 
$$(3)$$
 marks)

v.) 
$$\oint_{x^2-4x+13}^{1} dx$$
 (4 marks)

b) Express in partial fractions the expression  $\frac{5x-3}{(x+1)(x-3)}$ . Hence or otherwise find  $\sqrt[5x-3]{(x+1)(x-3)}dx$ 

## (4 marks)

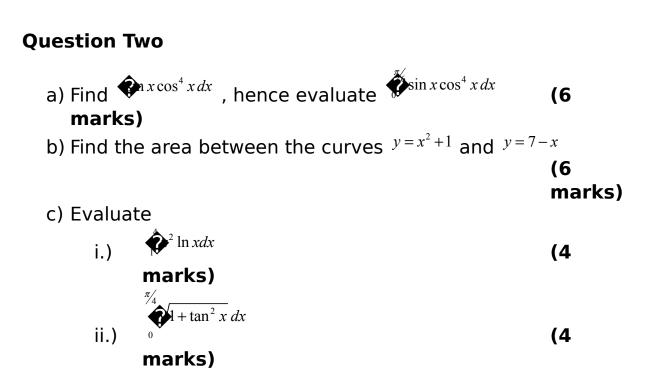
- c) It is estimated that t years from now the population of a certain lakeside community will be changing at the rate of  $0.6t^2 + 0.2t + 0.5$  thousand people per year. Environmentalists have found that the level of pollution in the lake increases at the rate of approximately 5 units per 1000 people. By how much will the pollution in the lake increase during the next 2 years? (4 marks)
- d) Determine the volume generated when the area above the axis bounded by the curve  $x^2 + y^2 = 9$  and the ordinates x=3 and x=-3 is rotated one revolution about the x-axis.

## (3 marks)

a) Evaluate  $\overset{(x, y)}{R} dA$ 

where 
$$f(x,y) = 1 - 6x^2y$$
 R:  $-1 @y @$ 

(3 marks)



#### **Question three**

