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**GARISSA UNIVERSITY**

**UNIVERSITY EXAMINATION 2019/2020 ACADEMIC YEAR TWO**

**SECOND SEMESTER EXAMINATION**

**SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES**

**FOR THE DEGREE OF BACHELOR OF EDUCATION**

**COURSE CODE: MAT 210**

**COURSE TITLE: CALCULUS**

**EXAMINATION DURATION: 2 HOURS**

**DATE: 17/02/2020 TIME: 09.00-11.00 AM**

**INSTRUCTION TO CANDIDATES**

* **The examination has FIVE (5) questions**
* **Question ONE (1) is COMPULSORY**
* **Choose any other TWO (2) questions from the remaining FOUR (4) questions**
* **Use sketch diagrams to illustrate your answer whenever necessary**
* **Do not carry mobile phones or any other written materials in examination room**
* **Do not write on this paper**

**This paper consists of TWO (2) printed pages *please turn over***

**QUESTION ONE (COMPULSORY)**

1. Evaluate the following integrals
2. **(4 Marks)**
3. **(4 Marks)**
4. **(4 Marks)**
5. Determine if the integral converges or diverges. If the integral converges, determine its value. **(5 Marks)**
6. Evaluate where

 **(3 Marks)**

1. Suppose that the velocity of an object is given by m/s.

Given that at time , the position of the particle is what is the position of the particle 4 seconds later. **(3 Marks)**

1. Evaluate **(4 Marks)**
2. Find the values of that satisfy the mean value theorem for integrals on given that **(3 Marks)**

**QUESTION TWO**

Evaluate

1. **(6 Marks)**
2. **(6 Marks)**
3. Evaluate **(8 Marks)**

**QUESTION THREE**

Evaluate the following integrals

1. **(6 Marks)**
2. **(8 Marks)**
3. **(6 Marks)**

**QUESTION FOUR**

1. Use trigonometric substitution to evaluate

 **(10 Marks)**

1. Determine if the following integral converges or diverges. If the integral converges determine its value
 **(10 Marks)**

**QUESTION FIVE**

1. Determine the length of . **(8 Marks)**
2. Evaluate
 **(4 Marks)**
3. Evaluate
 **(4 Marks)**
4. If show that **(4 Marks)**