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**GARISSA UNIVERSITY**

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

**SECOND SEMESTER EXAMINATION**

**SCHOOL OF SCHOOL OF PURE AND APPLIED SCIENCES**

**FOR THE DEGREE OF BACHELOR OF EDUCATION**

**COURSE CODE: MAT 112e**

**COURSE TITLE: INTEGRAL CALCULUS**

**EXAMINATION DURATION: 2 HOURS**

**DATE: 11/12/2020 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 THREE (3) 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 following integral converges or diverges. If the integral converges determine its value.  **[5 marks]**
6. Evaluate where **[3 marks]**
7. 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]**
8. Evaluate **[4 marks]**
9. Find the values of that satisfy the mean value theorem for integrals on **[3 marks]**

**QUESTION TWO (20 Marks)**

1. Evaluate
2. **[6 marks]**
3. **[6 marks]**
4. Evaluate **[8 marks]**

**QUESTION THREE (20 Marks)**

1. Evaluate the following integrals
2. **[6 marks]**
3. **[8 marks]**
4. **[6 marks]**

**QUESTION FOUR (20 Marks)**

1. Use trigonometric substitution to evaluate **[6 marks]**
2. **[6 marks]**
3. Determine if the following integral converges or diverges. If the integral converges determine its value. **[8 marks]**

**QUESTION FIVE (20 Marks)**

1. Determine the length of . **[8 marks]**
2. Evaluate **[4 marks]**
3. **[4 marks]**
4. Evaluate **[4 marks]**