

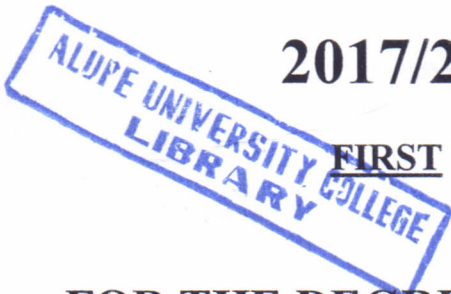


**OFFICE OF THE DEPUTY PRINCIPAL**  
**ACADEMICS, STUDENT AFFAIRS AND RESEARCH**

**UNIVERSITY EXAMINATIONS**

**2017/2018 ACADEMIC YEAR**

**FIRST YEAR FIRST SEMESTER EXAMINATION**



**FOR THE DEGREE OF BACHELOR**  
**OF SCIENCE IN COMPUTER SCIENCE**  
**/APPLIED STATISTICS WITH**  
**COMPUTING**  
**SCHOOL: SCIENCE**

**COURSE CODE: MAT 110**  
**COURSE TITLE: BASIC CALCULUS**  
**DATE: 18<sup>th</sup> December, 2017 TIME: 9.00am-12.00pm**

**For examiner's Use Only**

Question	I.E	E.E
CAT		
EXAM		
TOTAL		

**INSTRUCTION TO CANDIDATES: SEE INSIDE**

**THIS PAPER CONSISTS OF 20 PRINTED PAGES**

**PLEASE TURN OVER**

Insert the numbers of the questions you have answered in the order done

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Student Admission No.....Exam Card No.....Signature...

**INSTRUCTION TO CANDIDATES**

**Answer ALL questions from section A and any THREE from section B  
DO NOT WRITE ANYTHING ON THIS QUESTION PAPER**

**SECTION A [31 Marks] ANSWER ALL QUESTIONS**

**QUESTION ONE [16 marks]**

a) Evaluate the following limits

i.  $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$  [2mks]

ii.  $\lim_{x \rightarrow \infty} \frac{2x^3 - 3x}{5x^3 + 3}$  [2mks]

b)

i. Define the term continuous

ii. Determine whether or not the function below is continuous at  $x=1$  [2mks]

$$f(x) = \begin{cases} x^2 - 1 & ; x \neq 1 \\ 2 & ; x = 1 \end{cases} \quad [3mks]$$

c) Find the equation of the tangent and the normal to the curve  $x^2 + xy - y^2 = 1$  at the point (2,3) [3mks]

d) A circular hole 10cm in diameter and 30cm deep metal is rebored to increase the diameter to 10.3cm. Estimate the amount of metal to be removed. Use MVT [4mks]

**QUESTION TWO [15 marks]**

a) Evaluate the integral  $\int_2^4 (x^3 + 2x - 7) dx$  [4mks]

b) The gradient function of a curve is given by  $\frac{dx}{dy} = 3x^2 + 5$ . Given that the curve passes through the point (1, 8); determine the equation of the curve. [4mks]

c) Differentiate the following with respect to x

i.  $y = \ln(\ln x)$  [3mks]

ii.  $y = \sin(2x^2 + 3)$  [4mks]

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**INSTRUCTIONS TO CANDIDATES**

1. Write your **Admission Number, Exam Card Number** and **Sign** in the spaces provided at the bottom of each page of the Examination Booklet. **DO NOT** write your name anywhere in the booklet.
2. Write on both sides of the pages.
3. All rough work must be done in the Answer sheets and crossed through.
4. If supplementary pages are used, they must be fastened all together at the end of this Booklet. Supplementary pages should be used only after all the leaves in the booklet have been exhausted.
5. It is a serious examination offence to cheat or to have unauthorized materials including **MOBILE PHONES** (whether on or off) in the examination venue.
6. In no circumstances must Answer Booklet used or unused, be removed from the examination room by a candidate.
7. The Booklet is for **Examination use only** in a designated examination room. Unauthorized possession of the Answer sheets by a student or any other person constitutes an examination irregularity calling for stiff disciplinary action.
8. Do not pluck any page from this Booklet. Any extra/unused answer sheets should be returned to the **Examination Office**.
9. Candidates who come to examination room 30 minutes late will not be allowed to sit for the exam.
10. Candidates will not be allowed to leave the exam room once the exam commences.
11. Candidates are advised that importance is attached by examiners to accuracy and clarity of expression.
12. Committing any form of irregularity is prohibited and shall attract severe disciplinary action in accordance with Alupe University College Examination Regulations.

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