



**TECHNICAL UNIVERSITY OF MOMBASA**  
**INSTITUTE OF COMPUTING AND INFORMATICS**

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Select department

**UNIVERSITY EXAMINATION FOR:**  
**BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY**

**ICS 2400 : Transaction Processing System**

**END OF SEMESTER EXAMINATION**

**SERIES: APRIL 2016**

**TIME: 2 HOURS**

**DATE: 1 May 2016**

**Instructions to Candidates**

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other **TWO** questions.

**Do not write on the question paper.**

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**Question ONE**

a) Explain the following terms:

i) Host Language

ii) Concurrency

iii) Read-only transaction

[6 Marks]

b) Explain the difference between the following terms:

i) "Online Transaction Processing System" and "Transaction Processing Systems"

ii) "Commit\_Transaction" and "Rollback"

iii) "Single User System" and "Multiuser System"

[12 Marks]

c) Explain the four properties of a transaction.

[8 Marks]

d) State any four types of failures that may occur in transaction processing systems [4 Marks]

### Question TWO

a) Explain why concurrency control is need in a transaction processing systems [4 Marks]

b) Describe the following types of problems encountered when two transaction are executed concurrently:

i) Lost update problem

ii) Dirty read Problem

iii) Incorrect summary problem [6 Marks]

c) Using ATM transactions, explain the following transaction states:

i) BEGIN\_TRANSACTION

ii) READ\_ITEM(X)

iii) END\_TRANSACTION

iv) WRITE\_ITEM(X) [8 Marks]

d) State any four requirements for a business transaction [2 Marks]

### Question THREE

a) Explain why recovery is needed in a transaction processing systems [4 Marks]

b) Explain the term “System Log”. [2 Marks]

c) Using a well diagram, describe transaction processing system architecture [10 Marks]

d) Explain the “NO\_UNDO/REDO” recovery algorithm [4 Marks]

### Question FOUR

a) Explain the following types of schedules based serialisability

i) Serial

ii) Non-serial

iii) Serialisable transaction [6 Marks]

b) Outline the typical recovery procedures. [4 Marks]

c) For the following transaction processing applications, identify an example of transaction:

i) Banking

ii) Securities trading

iii) Insurance

iv) Inventory control

v) Military

[8 Marks]

d)

### **Question FIVE**

a) Explain the term “Query Processing” [2Marks]

b) With an aid of a diagram explain the major components of the query processing. [8 Marks]

c) Explain the following concurrency control protocols:

i) Locking protocols

ii) Timestamp protocols

[6 Marks]

d) Explain the following types of locks:

i) Binary lock

ii) Shared lock

[4 Marks]