# TECHNICAL UNIVERSITY OF MOMBASA

INSTITUTE OF COMPUTING AND INFORMATICS

Select department

## UNIVERSITY EXAMINATION FOR:

**BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY**

**ICS 2400 : Transaction Processing System**

END OF SEMESTER EXAMINATION

**SERIES:**APRIL2016

**TIME:**2HOURS

**DATE:**1May2016

**Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

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

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

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**Question ONE**

a) 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]

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) Explain the following terms:

i) Host language

ii) Concurrency

iii) Read-only transaction [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 [4 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 [4 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 [8 Marks]

**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]