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: 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.

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]