TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATIONS FOR DEGREE IN:
BACHELOR OF TECHNOLOGY IN INFORMATION COMMUNICAITON TECHNOLOGY (BTIT 12J-FT)

EIT 4405: ADVANCED DATABASE SYSTEMS

END OF SEMESTER EXAMINATION
SERIES: APRIL 2015
TIME: 2 HOURS

Instructions to Candidates:
You should have the following for this examination
- *Answer Booklet*

This paper consists of **FIVE** questions.
Attempt question **ONE (Compulsory)** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **TWO** printed pages

Question One (Compulsory)

a) Define the following terms:
- **(i)** Distributed database
- **(ii)** Time stamping
- **(iii)** Query optimization
- **(iv)** Database recovery
- **(v)** Data marts **(10 marks)**

b) Explain FOUR properties of a transaction **(4 marks)**

c) Differentiate between deadlock prevention and deadlock resolution **(4 marks)**

d) Discuss TWO advantages and TWO disadvantages of the web as a database platform **(4 marks)**

e) (i) Explain DDBMS **(2 marks)**
(ii) Discuss TWO motivation in providing DDBMS systems **(4 marks)**

f) Explain TWO causes of failure in a database system **(2 marks)**

Question Two

a) Discuss the benefits and problems associated with:
- **(i)** Data warehousing
- **(ii)** Data mining **(10 marks)**

b) Discuss why the weakness of the relational data model and relational DBMS would make them unsuitable for advanced database application **(10 marks)**

Question Three

a) Define the following security terms: **(6 marks)**
- **(i)** Back up
- **(ii)** Encryption
- **(iii)** Authentication

b) It has been said that 2-phase locking ensures serializability of concurrent transaction but does not ensure freedom from deadlock.
- **(i)** Explain the term serializability **(4 marks)**
- **(ii)** Show how deadlock occur when using the 2-phase locking protocol **(4 marks)**

c) Discuss how deadlock can be detected and handled once it occurs **(6 marks)**

Question Four

a) A user has to perceive the DDB as a single logical entity. Describe FOUR types of distributed transparency that facilitates a single system image **(8 marks)**

b) Check points tend to cub the disadvantages of database recovery using log based method:
- **(i)** Explain what checkpoints
- **(ii)** Why are checkpoint important
- **(iii)** With the help of a diagram, explain how checkpoint works **(4 marks)**

c) Explain how a deadlock can occur in a distributed environment **(4 marks)**

Question Five

a) Using examples, explain the need for concurrency control in database transaction processing. **(9 marks)**

b) In detail, explain the typical phase of query optimization **(6 marks)**

c) Explain FIVE roles of DBA broadly **(5 marks)**