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**University Examinations 2014/2015**

FOURTH YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR DEGREE OF BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY, BACHELOR OF COMPUTER SCIENCE AND BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

**CIT 3326/CCS 3326: ADVANCED DATABASE SYSTEMS**

**DATE: OCTOBER 2015 TIME: 2 HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. Differentiate between the following terms as used in database systems:
2. OO-DDBMS and DDBMS.
3. Replication and mirroring.
4. Centralized database and distributed database.
5. Transactions manager and scheduler. (8 Marks)
6. What is the difference between recovery techniques and recovery procedures? (2 Marks)
7. Describe three security threats to a database system. (6 Marks)
8. Describe the role of each of the following people in an organization:
9. System Administrator.
10. System Analyst.
11. Network Administrator.
12. Database Administrator.
13. Database Designer.
14. Database Developer. (6 Marks)
15. Describe the four components of a distributed database system. (4 Marks)
16. Explain the two types of database security mechanisms. (4 Marks)

**QUESTION TWO (20 MARKS)**

1. Using an appropriate diagram, explain each of the stages of a state transition of a transaction and indicate the direction of the transition at each stage. (10 Marks)
2. Transactions that are running concurrently may suffer from different problems especially during the write and/or read procedures. Explain the following interferences using appropriate diagrammatic illustrations and give examples and their solutions.
3. Lost update problem.
4. Uncommitted dependency problem (10 Marks)

**QUESTION THREE (20 MARKS)**

1. What do you understand by the following two Date’s rules for DDMS:
2. Local autonomy.
3. Continuous operation (2 Marks)
4. Zdonik and Maier presented a threshold model that an OODBMS must at minimum satify. Explain two of these thresholds. (4 Marks)
5. Deadlocks have been known to be a major headache in database systems. Give a detailed analysis of deadlocks in database systems. Explain the following terms in database recovery:
6. Recovery features
7. Recovery facilities (4 Marks)
8. Describe three restart procedures used as techniques for recovering from a failed database. (6 Marks)

**QUESTION FOUR (20 MARKS)**

1. Allocation alternatives are methods used to place data items on different sites in a DDBS. Describe to allocation alternatives as used in DDBS. (4 Marks)
2. Explaining why they may be considered important, describe the following database structures:
3. Hierarchical Structure.
4. Network Structure.
5. Relational Structure.
6. Object Oriented Database. (8 Marks)
7. Describe four causes of failure in database systems and explain their possible recovery methods. (8 Marks)

**QUESTION FIVE (20 MARKS)**

1. Discuss four causes of failure in database systems and explain their possible recovery methods. (12 Marks)
2. Discuss any four date’s rules of distribution in Database Management Systems.(8 Marks)