

ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD
(Department of Computer Science)

WARNING

1. **PLAGIARISM OR HIRING OF GHOST WRITER(S) FOR SOLVING THE ASSIGNMENT(S) WILL DEBAR THE STUDENT FROM AWARD OF DEGREE/CERTIFICATE, IF FOUND AT ANY STAGE.**
2. **SUBMITTING ASSIGNMENTS BORROWED OR STOLEN FROM OTHER(S) AS ONE'S OWN WILL BE PENALIZED AS DEFINED IN "AIOU PLAGIARISM POLICY".**

Course: Database-II (3467)
Level: BS (CS)

Semester: Autumn, 2012
Total Marks: 100

ASSIGNMENT No. 1

Note: All questions are compulsory and carry equal marks.

- Q. 1 Differentiate between logical database design and physical database design. Show how this separation leads to data independence.
- Q. 2 Define the five basic operators of relational algebra with an example each.
- Q. 3
 - a) Describe the responsibilities of the DBA and the database designer.
 - b) Explain Boyce-Codd Normal Form with example and also compare BCNF and 3NF.
- Q. 4 Draw and explain the three level architecture of the database system.
- Q. 5 With the help of a diagram describe the typical component modules of a DBMS.

ASSIGNMENT No. 2

Total Marks: 100

Note: All questions are compulsory and carry equal marks.

- Q. 1 What is database integrity? A well-maintained relational DBMS has a high level of data integrity. What features of a relational DBMS contribute towards this level of integrity?
- Q. 2
 - a) Why database security is important? Explain the major issues related to database security.
 - b) Describe the advantages and disadvantages of DBMS-provided and application-provided security.

- Q. 3 a) Discuss different types of database failures that may occur in database environment?
b) Describe Shadow Paging Recovery Technique? Under what circumstances does it not require a transaction log? List advantages and disadvantage of shadow paging?
- Q. 4 What is deadlock? How deadlocks can be detected and prevented? Also explain the modules for concurrency control.
- Q. 5 Design an ER diagram for an IT training group database that will meet the information needs for its training program. Clearly indicate the entities, relationships and the key constraints. The description of the environment is as follows:
“The company has 12 instructors and can handle upto 100 trainees for each training session. The company offers 5 advanced technology courses, each of which is taught by a team of 2 or more instructors each instructor is assigned to a maximum of two teaching teams or may be assigned to do research each trainee undertakes one advanced technology course per training session”.
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3467/3504 Database-II

Credit Hours: 3 (3+0)

Recommended Book:

Modern Database Management 4th Edition by Jeffrey Hoffer

Course Outlines:

Unit No. 1 Overview of Database

Modeling Techniques, Data Models, Relational Database Management System, Relation and Its Properties, Relational Algebra

Unit No. 2 Higher Normal Forms

Overview of Simple Normal Forms, Higher Normal Forms, Boyce-Codd Normal Form, 4th Normal Form, 5th Normal Form

Unit No. 3 Database Administration

Introduction, Layers of Database Administration, DBA Functions and Responsibilities

Unit No. 4 Database Integrity

Introduction, Integrity Rules (Entity Integrity, Referential Integrity (Insertion Rule, Deletion rule (Restrict, Nullify, Cascade))), Ranges of Values, Not Null, Selection Based Entry (Radio Buttons, Check Boxes, Lov)

Unit No. 5 Database Security

Introduction, Physical Security (Locks, Logbooks, Staff Categorization), Database Security (View, Authorization Table (Subject, Object, Privileges), User Defined procedures, Encryption)

Unit No. 6 Database Recovery

Introduction, Reasons of Database Failure, Database Recovery Facilities, Backup, Logs (Transaction Log, Database Change Log), Database Recovery Methods (Restore, Roll Forward, Roll Backward), Transaction Processing

Unit No. 7 Database Concurrency

Introduction, Problem of Lost Updating, concurrency control Methods (Optimistic Approach, Pessimistic Approach), Managing the Deadlock, Transaction Integrity

Unit No. 8 Distributed Databases

Introduction, Types of Distributed Databases, Advantages and Disadvantages of Distributed Databases

Unit No. 9 Object Oriented Databases

Introduction to Object Oriented Paradigm, Differences in Object Model and Relational Model, Object Oriented Analysis and Design, Costs and Benefits of Object Databases

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