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Third Semester MCA Degree Examination, Dec.08/Jan.09
Data Base Management Systems

Time: 3 hrs.

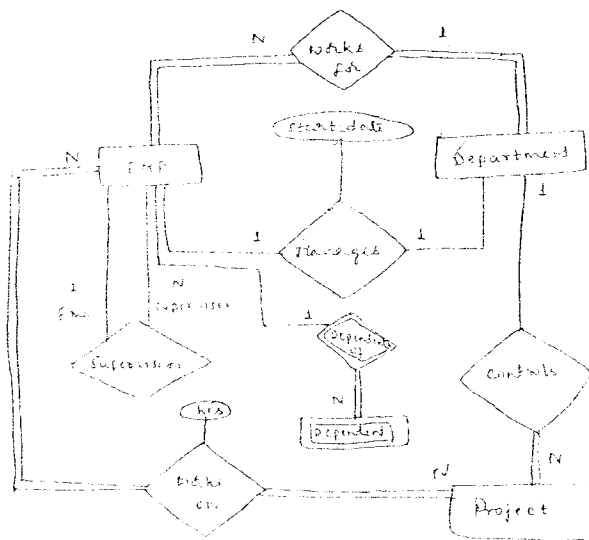
Max. Marks:100

Note : Answer any FIVE full questions.

- 1 a. With a neat diagram explain the architecture of Data Base Management Systems. (10 Marks)
- b. Explain the client-server architecture. (06 Marks)
- c. Describe the classification of Data Base Management Systems. (04 Marks)

- 2 a. Define the following terms (06 Marks)
 - i) Weak Entity; ii) Descriptive attribute; iii) Recursive relationship.
- b. Explain the different cardinalities applied in E-R model with an example each. (04 Marks)
- c. Notown Records has decided to store information about musicians who perform on its albums in a data base. Design an E-R diagram on considering the following specifications. Specify properly cardinality constraints and keys
 - i) Each musician that records at Notown has an SSN, name, an address and a phone number. Phone number can be more than one.
 - ii) Each instrument used in songs recorded at Notown has a name and a musical key.
 - iii) Each album recorded on the Notown label has a title, a copyright date, a format and an album identifier.
 - iv) Each song recorded at Notown has a title and an author.
 - v) Each musician may play several instruments, and a given instrument may be played by several musicians.
 - vi) Each album has a number of songs on it but, no song may appear on more than one album.
 - vii) Each song is performed by one or more musicians and a musician may perform a number of songs.
 - viii) Each album has exactly one musician who acts as its producer. A musician may produce several albums. (10 Marks)

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Map the given E-R diagram into relational schema, using E-R to relation mapping algorithm. Assume suitable attributes, primary key and foreign key of each relation.

(20 Marks)

- 4 a. Consider the following relational schema and answer the following queries using relational algebra ENP (Name, SSN, Bdate, Address, Sex, Salary, SSSN, DNO)
Department (Dname, DNO, MSSN, Msdate)
Dept-loc (DNO, DLOC), Project (Pname, Pno, PLOC, DNO)
Works – ON (ESSN, PNO, HOURS)
Dependent (ESSN, Dname, Sex, Bdate, relationship)
- Retrieve the names of all Employees in dNO = 5 who work more than 10hrs/week on product 'X' project.
 - Retrieve the names of all Employees who work on every project.
 - For each department retrieve the department name, and the average salary of all the Employees working in that department.
 - List the names of all department managers who have no dependents.
 - Retrieve the average salary of all female Employees. (15 Marks)
- b. What are DML and DCL commands in SQL? Give an example for any one command from DML and DCL. (05 Marks)
- 5 a. Bring out different clauses of SELECT – FROM – WHERE – GROUP – HAVING with an example each. (10 Marks)
- b. Explain CREATE and ALTER commands. (05 Marks)
- c. For the same relational schema mentioned in Q. No.4 answer the following queries in SQL.
- List the Employees name, project name and department name in which they are working.
 - Hike the salary of the Employees working in department 7 by 5%. (05 Marks)
- 6 a. Define:
- Functional dependency.
 - Multivalued Dependency. (05 Marks)
- b. Discuss Insertion, Deletion and Updation anomalies by taking suitable examples. (09 Marks)
- c. Explain 3NF with an example. (06 Marks)
- 7 a. Explain ACID properties of a transaction. (08 Marks)
- b. Explain strict 2PL. (08 Marks)
- c. Discuss how check pointing helps in database recovery. (04 Marks)
- 8 Write short notes on:
- Three levels of data abstraction in DBMS.
 - Views in SQL.
 - Serializability.
 - Data Models. (20 Marks)

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07MCA34

Third Semester MCA. Degree Examination, June-July 2009
Database Management Systems

Time: 3 hrs.

Max. Marks:100

Note : Answer any FIVE full questions.

- 1 a. Discuss the main characteristics of database approach and how it differs from traditional file systems. (04 Marks)
b. What are main functions of DBA? List them. (04 Marks)
c. What is DBMS? Explain the component modules of a DBMS and their interactions with a diagram. (12 Marks)
- 2 a. Explain the operations of a three - tier client / n – tier architecture for RDBMS with a diagram. (04 Marks)
b. Define the following terms : i) Federated database system ii) Database schema iii) Complex attribute. (06 Marks)
c. Draw ER – diagram for the MOVIES database. Consider entities like ACTOR, MOVIE, DIRECTOR and PRODUCER. (10 Marks)
- 3 a. Discuss relational model constraints. (05 Marks)
b. How are outer join operations different from inner join operation? (05 Marks)
c. Given the following database schema
Sailors (sid, sname, colour)
Boats (bid, bname, colour)
Reserves (sid, bid, day) where sid = sailor id, bid = boat id. Write the queries in relational algebra to
i) Find the names of the sailors who have reserved boat 110.
ii) Find the names of sailors who have reserved all boats.
iii) Find the names of sailors who have reserved a red or a green boat.
iv) Find the names of sailors who have reserved at least one boat. (10 Marks)
- 4 a. What are different attribute data types and domains in SQL? Explain. (05 Marks)
b. What are closure operations in relational algebra? (05 Marks)
c. Explain the seven – step algorithm to convert the basic ER model constructs into relations. (10 Marks)
- 5 a. What are views in SQL? (06 Marks)
b. Discuss the INSERT, DELETE and UPDATE statements in SQL with examples. (06 Marks)
c. Use the schema shown in Q.3(c) and answer the queries using SQL. (08 Marks)
- 6 a. What is meant by impedance mismatch in case of database programming? How to minimize this problem. (04 Marks)
b. Discuss database stored procedure and SQL / PSM. (06 Marks)
c. Define Normalization. List all Normal forms with an example. (10 Marks)
- 7 a. Explain strict Two – Phase Locking (Strict – 2PL). (08 Marks)
b. Describe recovering from a system crash. (12 Marks)
- 8 Write short notes on:
a. Relational Algebra
b. Embedded SQL
c. Correlated Nested Queries.
d. ER – diagram Notations. (20 Marks)

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Third Semester MCA Degree Examination, Dec.09-Jan.10
Database Management Systems

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

- 1
 - a. Explain briefly the advantages of using DBMS. (08 Marks)
 - b. Explain the classification of database management systems. (08 Marks)
 - c. Who are the actors on the screen and workers behind the scene? (04 Marks)

- 2
 - a. Explain the several types of attributes in ER model. Give example for each. (08 Marks)
 - b. Draw an ER diagram for a database that keeps track of company and employee phones. Assume appropriate entities, attributes and relationships. Reduce it into tables. (08 Marks)
 - c. What is a participation role? When is it necessary to use role names in the description of relationship types? (04 Marks)

- 3
 - a. What is a relation? Explain briefly the characteristics of relations. (06 Marks)
 - b. With the help of examples, explain union compatible relational algebra operations. (09 Marks)
 - c. Explain division operation. When is this operation useful? (05 Marks)

- 4
 - a. Explain briefly the schema evolution commands available in SQL. (06 Marks)
 - b. What is SELECT statement? Explain its basic form. Give examples. (06 Marks)
 - c. Consider the following relational schema :
 WORKS (Emp-name, Comp-name, Salary, Ph-Num)
 LIVES IN (Emp-name, Street, City)
 LOCATED-IN (Comp-name, City)
 MANAGER – OF (Mgr-name, Emp-name)
 Write the SQL Queries for the following :
 - i) Find the names of the employees, who live and work in the same city.
 - ii) Find the names of the employees, who do not work for the company "SBM".
 - iii) Find the names of the employees and their salary, whose manager is "Fleming".
 - iv) Delete all the employees, who work for the company "SBM". (08 Marks)

- 5
 - a. What is a view? How is view created? Explain with an example. (06 Marks)
 - b. Explain briefly the additional features of SQL. (06 Marks)
 - c. Explain the terms embedded SQL, dynamic SQL and stored procedures clearly. (08 Marks)

- 6
 - a. Define functional dependency. Write all its inference rules. (06 Marks)
 - b. What are normal forms? Explain the normal forms proposed by Codd. (08 Marks)
 - c. Consider a relation R (A, B, C, D, E) with the following dependencies
 $AB \rightarrow C, CD \rightarrow E, DE \rightarrow B$
 Is AB a candidate key of this relation? If not, is ABD? Explain your answer. (06 Marks)

- 7
 - a. Explain briefly the ACID properties. (06 Marks)
 - b. Explain the 2PL protocol, briefly. (08 Marks)
 - c. What are WR, RW and WW conflicts? Explain. (06 Marks)

- 8

Write short notes on :

a. Three – schema architecture	b. Different types of JOIN
c. Assertion and Trigger	d. Crash recovery.

(20 Marks)

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07MCA34

Third Semester MCA Degree Examination, May/June 2010 Database Management Systems

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

- 1
 - a. Define database management system. (04 Marks)
 - b. Explain the advantages of DBMS approach over conventional data processing. (10 Marks)
 - c. Describe three schema architecture and DBMS languages. (06 Marks)

- 2
 - a. Explain the relationship types, with examples. (06 Marks)
 - b. List the notations used in E-R diagrams including cardinality and total participation. (06 Marks)
 - c. Explain the following with examples:
 - i) Degree of relationship
 - ii) Multi valued attributes
 - iii) Derived attributes
 - iv) Total participation (08 Marks)

- 3
 - a. In a banking system, each branch is described with a unique branch-id, branch-name, city and assets; each account is described with a unique account-number and balance; each loan is described by a unique loan-number, sanctioned amount and loan-due amount; each customer is described by a unique customer-id, customer-name, address and phone-number.
 Each branch has a number of accounts belonging to it and an account belongs to only one branch. Each branch has sanctioned a member of loans from it and a loan is sanctioned through only one branch. A customer can have one or more accounts and an account can belong to one or more customers. Similarly a customer may avail one or more loans and a loan can be sanctioned to one or more customers.
 Draw an E-R diagram for the above system and give the database schema for the same. (16 Marks)
 - b. Distinguish between primary key, super key, candidate key and foreign key. (04 Marks)

- 4
 - a. Consider the following relational schema:
 Project (P_num, P_name, Chief_architect)
 Employee (E_num, E_name, address)
 Assigned to (P_num, E_num)
 Answer the following queries in relational algebra:
 - i) Get the employee number of employees working on project 'COMP353'.
 - ii) Get details of employee working on project 'COMP353'.
 - iii) Obtain details of employees working on the 'database' project.
 - iv) Gather the details of employees working on both projects 'COMP353' and 'COM354'.
 - v) Find the employee numbers of employees who do not work on project 'COMP453'. (10 Marks)
 - b. Explain any five operations in relational algebra, with suitable examples. (10 Marks)

- 5
 - a. Consider the following database schema:
 Employee (SSN, E_name, Bdate, sal, address, MgrId, Dno)
 Department (Dnum, Dname, MgrSSN)
 Project (Pno, Pname, Ploc, Dnumber)
 Works-on (ESSN, Pno, Hours)
 Dependent (ESSN, DId, Dep-name, Sex, Bdate, relationship)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification number to evaluator and/or equations written eg, 42+8 = 50 will be treated as malpractice.

Question No.5(a) continued...

Write the following queries in SQL:

- i) For every project located in 'USA', list the Pno, controlling department number, department manager name, address and birth date.
 - ii) Retrieve each department number, the number of employees in the department and their average salary.
 - iii) Retrieve the name and address of all employees who work for the 'admin' department.
 - iv) Retrieve the name and salary of the manager of each department.
 - v) Find which project and location 'sin' is working on. (10 Marks)
- b. Explain the following commands in SQL, with examples:
- i) DROP ii) CREATE iii) ALTER
 - iv) UPDATE v) ROLLBACK (10 Marks)

- 6 a. Discuss the anomalies encountered in an un-normalized data base, with examples. (06 Marks)
- b. What is normalization? (04 Marks)
- c. Convert the following unnormalized data into third normal form: (10 Marks)

Invoice #	Date	Customer #	Customer name	Title Id	T name	Qty	Cost
101	01/04/09	C1	Mohan	T1	Oracle	200	350
101	01/04/09	C1	Mohan	T2	C	300	325
102	03/05/09	C2	Ram	T3	Sybase	750	400
105	12/06/09	C1	Mohan	T4	C++	500	250
105	12/06/09	C1	Mohan	T2	C	200	325

- 7 a. What is a transaction? Explain the concurrent access to data, with an example. (06 Marks)
- b. Explain two different techniques used in concurrency control. (08 Marks)
- c. Briefly discuss the recovery of data in a database. (06 Marks)

- 8 Write short notes on: (20 Marks)
- a. ACID properties
 - b. Aggregate functions
 - c. Database users
 - d. Views

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