DBMS

QP Code :17784

(3 Hours) | Total Marks : 100

N. B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** from remaining **six** questions
(3) **All** questions carry **equal** marks.

1. Write short note on any **four** of the following :– 20
   (a) Clustering in Datamining
   (b) Search Engine.
   (c) 3 Phase Commit Protocol.
   (d) Metadata
   (e) Multidimensional Cubes.

2. (a) Why recovery in a distributed DBMS more complicated than in a centralized system. Explain 10
   (b) Discuss phases of datamining process. 10

3. (a) What are components of decision tree? Explain how the decision tree constructed 10
   (b) Explain in detail Synchronous Replication and Distributed Catalog Management. 10

4. (a) Explain Neural Networks and decision trees. 10
   (b) Explain architecture of parallel database system. 10

5. (a) What is Bell-La-Pedula model? What type of security is implemented by it. 10
   (b) Explain datawarehouse implementation technique. 10

6. (a) Explain the characteristics and architecture of search engines. 10
   (b) Explain snowflake and star schemas with suitable examples. 10

7. Differentiate between following :– 20
   (a) OLAP vs OLTP
   (b) Distributed databases vs Centralized databases.
   (c) Bloom Joins vs Semi Joins.
   (d) OODBMS vs ORDBMS

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DBMS III 2/12/14
CBGS

Duration 3 hours **OP Code : 17878**

Total 80 marks

N.B: 1) Question No. 1 is compulsory.
2) Attempt any four questions out of remaining six questions.
3) Assumptions made should be clearly stated.

1 Consider a university database for a university registrar's office. A university registrar's office maintains data about the following entities:

- Course includes number, title, credits
- Course offering includes course number, year, semester, instructor, time, class room
- Students includes student id, name, program
- Instructor includes id no, name, department title

a) Construct an ER diagram for the registrar's office. Document all assumptions that you make for designing. [10]

b) Write schema definition and normalize all tables to 3NF for the above ER diagram. [10]

2 a) What is transaction? Discuss the various states through which a transaction moves. [08]

b) Explain hash based indexing. Discuss the use of the hash function in identifying a bucket to search. [07]

3 a) What is deadlock? Describe deadlock detection and prevention techniques. [08]

b) Write a short note of query optimization. [07]

4 a) What is Normalization? What are the two required conditions for normalization through decomposition of data? [08]

b) Explain the architecture of database system. How it is different from conventional file system. [07]

5 a) Discuss locks, granting of locks and implementation of locks. Describe two-phase locking protocol. [08]

b) Suppose the relational schema R(A,B,C,G,H,I) and set of functional dependencies are

$A \rightarrow B$ $CG \rightarrow I$
$A \rightarrow C$ $B \rightarrow H$
$CG \rightarrow H$

Obtain other functional dependencies and compute closure of AG^+ [07]

6 Differentiate between (Any Three) [15]

a) B tree and B+tree
b) Generalization and Specialization
c) Functional dependency and Multi-valued Functional dependency
d) Strong Entity and weak entity

7 Write short notes on (Any Three) [15]

a) Bell-LaPadula Model
b) ACID Properties
c) Data Model and its type
d) Shadow Paging

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Con. 3106–13.

CE–8326

(3 Hours) [Total Marks : 80

N. B. : (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** from remaining Question Nos. 2 to 7.

1. Design a database for the following :–
A person may be employed by one or more organizations and each organization may be the employer of one or more persons. An organization can be an internal organizational unit or an external organization. For persons and organizations, we want to know their ID, name, address and phone number. For person, we want to know their birth date and for organizations, we want to know their budget. For, each employment, we want to know the employment date and hours. Employment of a person by an organization may result in the person holding many positions over time. For each position, we want to know its title and each time someone holds that position, we need to know the start date, termination date and salary.
(a) Construct an ER diagram for the above. Document all assumptions. 10
(b) Write a schema definition and normalize all tables to 3NF for the above ER diagram. 10

2. (a) Explain dynamic hashing with an example. 8
(b) Explain the various steps of processing a high level query. 7

3. (a) Explain the desirable properties of decomposition. 8
(b) What is transaction ? Explain the ACID properties of transaction. 7

4. (a) Expalin architecture of database system. Explain how it is different from conventional file system. 8
(b) What is a locking protocol ? Describe the two phase locking protocol and strict two phase locking protocol. 7

5. (a) Explain Bell-La Padula model of database security. 8
(b) Explain the responsibilities of DBA. 7

6. (a) Write a short note on recoverable schedule. 5
(b) Suppose that we decompose the schema – 5
$R = (A, B, C, D, E)$ into $R_1 (A, B, C)$ $R_2 (A, D, E)$. Show that this decomposition is a lossless join decomposition if the following set F of functional dependencies holds :–
$A \rightarrow BC, \quad CD \rightarrow E, \quad B \rightarrow D, \quad E \rightarrow A$

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(c) A relation R with four attributes R = (A B C D) 5

F = { C→D, C→A, B→C }

Identify the candidate key (s) for R Identify the best normal form that R satisfies (1NF, 2NF, 3NF).

7. (a) Write a short note on data dictionary. 5

(b) Differentiate between Strong Entity set and Weak Entity set. 5

(c) Write a short note on types of locks. 5

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MCA - III CBGS

Database Management System.

QP Code : GJ-2389

(3 Hours) **[Total Marks : 80**

N.B: 1) Question No. 1 is compulsory

2) Attempt any four from the remaining Questions No.2 to No.7

Q1. Design a database for the following situation: 20

The Motor Vehicle Branch administers driving tests and issues driver's licenses. Any person who wants a driver's license must first take a learner's exam at any Motor Vehicle Branch in the province. If he/she fails the exam, he can take the exam again any time after a week of the failed exam date, at any branch. If he passes the exam, he is issued a license (type = learner's) with a unique license number. The person may take his driver's exam at any branch any time before the learner's license expiry date (which is usually set at six months after the license issue date). If he passes the exam, the branch issues him a driver's License.

a) Construct an ER diagram for the above. Document all assumptions that you make for designing.

b) Write a schema definition and normalized all tables to 3NF for the above ER diagram.

Q2. a) What is B tree and B+ tree? How it is used in maintain indexes in database? How concurrency in index structured is handled? 8

b) Discuss the various steps of processing a high level query. 7

Q3. a) Explain the architecture of database system and also explain how it is different from the conventional file system. 8

b) What is a locking protocol? Describe the two phase locking protocol and strict two phase locking protocol. 7

Q4. a) Explain the terms Lossless join decomposition and dependency preservation decomposition. 8

b) What is data model? Explain network model with its advantages and disadvantages? 7

Q5. a) Differentiate between the following 8

1) Logical data independence and physical data independence

2) Sophisticated users and specialized users

b) Explain Bell-LaPadula model of database security 7

Q6. a) What is transaction? Explain the ACID properties of transaction. 8

b) Explain the responsibilities of DBA. 7

Q7. Write a short note on (any 3) 15

1) Shadow paging

2) Hash based indexing

3) Serializability

4) Closure of set of FD

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Sub:-Database Management System.
Date:-30/12/2010

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AP–5952

(3 Hours)

[Total Marks : 100

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N.B. : (1) Q. No. 1 is **compulsory**.
(2) Answer any **four** from the remaining **six** questions.
(3) **All** questions carry **equal** marks.

Q1 a) A General Hospital consists of a number of specialized wards (such as Maternity, Pediatrics, Oncology, etc). Each ward hosts a number of patients, who were admitted on the recommendation of their own GP and confirmed by a consultant employed by the Hospital. On admission, the personal details of every patient are recorded. A separate register is to be held to store the information of the tests undertaken and the results of a prescribed treatment. A number of tests may be conducted for each patient. Each patient is assigned to one leading consultant but may be examined by another doctor, if required. Doctors are specialists in some branch of medicine and may be leading consultants for a number of patients, not necessarily from the same ward. (10)

Construct an ER Diagram for the above example. Document all assumptions made about mapping constraints.

b) Write the schema definition and normalize all tables to 3NF for the ER Diagram generated. (10)

Q2 a) Given the following relational schema, write SQL statements (10)

```
branch (branch_name, branch_city, assets)
customer (customer_name, customer_street, customer_city)
loan (loan_number, branch_name, amount)
borrower (customer_name, loan_number)
account (account_number, branch_name, balance)
depositor (customer_name, account_number)
```

i) Find the names of all branches in the *loan* relations, and remove duplicates
ii) Find the name, loan number and loan amount of all customers having a loan at the Perryridge branch.
iii) Find the names of all branches that have greater assets than some branch located in Brooklyn.
iv) Find the average account balance at the Perryridge branch.
v) Find the number of depositors for each branch.

b) Explain the Bell LaPadula model (10)

Q3 a) Explain briefly the different data models. (10)

b) i) What are views ? Discuss views in the context of security and logical data independence. (10)

ii) Explain the concept of triggers.

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Q4 a) What is serializability? Explain conflict serializability and view serializability (10)

b) Describe the ways in which JOIN can be performed in SQL. Explain each type with an example (10)

Q5 a) What is a deadlock? Describe the various deadlock detection and prevention schemes (10)

b) What are functional dependencies? How do they help in removing redundancy from a database design? (10)

Suppose the relational schema R = (A,B,C,G,H,I) has a set of FDs

A -> B

A -> C

CG -> H

CG -> I

B -> H

For the above set of FDs apply the rule of transitivity, union, pseudotransitivity to obtain other FDs

Q6 a) Write a detailed note on Query Optimization. (10)

b) What is a locking protocol? Describe in detail the two-phase locking protocol and the strict two-phase locking protocol. (10)

Q7 a) Write short notes on (20)

i) Shadow Paging

ii) B+ Trees

iii) ACID

iv) WAL

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SY BMS SEM-III (R) DBMS 2nd Dec 2014

Q.P. NO : **17862**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question **No. 1** is **Compulsory**.
(2) Attempt any **four** out remaining **six** questions.

1. A General Hospital consists of a number of specialised wards (such as Maternity, Pediatrics, Oncology, etc). Each ward hosts a number of patients, who were admitted on the recommendation of their own GP and confirmed by a consultant employed by the Hospital. On admission, the personal details of every patient are recorded. A seperate register is to be held to store the information of the tests undertaken and the results of a prescribed treatment. A number of tests may be conducted for each patient. Each patient is assigned to one leading consultant but may be examined by another doctor, if required. Doctors are specialists in some branch of medicine and may be leading consultants for a number of patients, not necessarily from the same ward. 20
   i) Construct an ER diagram for the above systems. Document, all assumptions that you make for designing.
   ii) Write schema definition and normalize all tables to 3NF for the above ER diagram.

2. (a) What is date model ? Discuss Hierarchical model in DBMS with the advantages and disadvantages. 10
   (b) Explain the various states of transaction in database. 10

3. (a) Explain the shadow paging recovery technique. 10
   (b) Differentiate the following (any two) 10
   i) Dense Index vs Sparse Index
   ii) Weak vs Strong Entity
   iii) 3NF vs BCNF

4. (a) How serializability is ensurd in 2 PL protocol. Discuss locks, granting of locks and implementing locks. 10
   (b) What is timestamp protocol and how it is used for concurrency control? 10

5. (a) Write a detailed note on query optimization. 10
   (b) What is deadlock? Discuss deadlock detection and prevention techniques. 10

6. (a) What is normalization? Explain the two conditins required during normalization through decomposition of data. 10
   (b) Explain Bell LaPadula model. 10

7. Write short note on the following **(any four)** 20
   (i) Super key, Candidate key, Primary key
   (ii) Natural Join
   (iii) Aggregation
   (iv) MVD
   (v) DBA

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