

12532

MCA (Revised)
Term-End Examination
June, 2010

MCS-043 : ADVANCED DATABASE DESIGN

Time : 3 hours

Maximum Marks : 100

Note : Question number 1 is compulsory. Answer any three questions from the rest.

1. (a) The ABC Bank offers five types of Accounts : loan, checking, savings, daily interest saving and money market. It operates a number of branches within the country. A client of the bank can have any number of accounts. Accounts can be self or a joint account. **10**
- (i) Draw an EER diagram for the ABC bank identifying various entities, attributes and cardinality. Show meaningful relationships that exist among the entities.
- (ii) Translate the EER diagram to schema Relational Model.

(b) Explain the following protocols for concurrency control in transactions with the help of an illustration for each : 10

(i) Tree - protocol

(ii) Timestamp - Based Protocol.

(c) With the help of a process diagram, explain the various tasks involved in the Knowledge Discovery in Databases (KDD) process. 10

(d) Explain the role of ODBC and JDBC with the help of an example. 6

(e) Is the following XML document well formed ? Justify your answer : 4

```
< ?xml version="1.0" standalone="yess" ? >
```

```
< employee >
```

```
    < name > Amit </name >
```

```
    < position > Professor </position >
```

```
</employee >
```

```
< employee >
```

```
    < name > Sumit </name >
```

```
    < position > Reader </position >
```

```
</employee>
```

2. (a) What are multimedia databases (MMDBs) ? 10
List some of the applications of MMDBs.
Describe various contents of MMDBs. Also,
mention the challenges in designing of
MMDBs.

- (b) Define Multi-valued dependencies and Join dependencies. Give an example of each. State fourth and fifth normal form. 6
- (c) Consider a relation R (A, B, C) with functional dependencies $AB \rightarrow C$ and $C \rightarrow A$. Decompose the relation R into BCNF relations. 4
3. (a) With the help of a diagram, explain the *reference* architecture of Distributed DBMS. How is this different from component Architecture of DDBMS ? 10
- (b) Explain the following two ways to implement the object-oriented concepts in DBMS : 10
- (i) To extend the existing RDBMS to include object orientation.
- (ii) To create a new DBMS that is exclusively devoted to OODBMS.
4. (a) What is a (DW) Data Warehouse ? Explain the basic components of a DW. 6
- (b) Consider a Supply Data of an organization having three dimensions as Supplier, Part and Project. Draw a star schema with supply as the fact table. Make suitable assumptions. 6

- (c) Explain the following in the context of ORACLE/POSTGRESQL : **8**
- (i) Triggers
 - (ii) Security
 - (iii) Data Dictionary
 - (iv) Indexing
5. (a) With reference to special Databases and GIS explain the following :
- (i) Application of Geographic Databases **3**
 - (ii) Requirements of a GIS **4**
 - (iii) Operations on the data captured in GIS **3**
- (b) Consider the following query : **5**
- ```
SELECT EmpId, EmpName, DeptName,
DeptLve
FROM Employee, Department
WHERE Employee. DeptNo = Department.
DeptNo AND Employee, Salary > 10000
```
- Create a query evaluation plan for the query given above. Make suitable assumptions about the relation and statistics.
- (c) Explain Cursors. Explain the role of cursors in Embedded SQL with the help of an example. **5**
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