Advanced Database Management Systems
I.T/CBGS/V/ADMS /13-12-2016

Q.P. Code : 594502

(3 hours) **Marks : 80**

Note : 1) Question no. **1** is **compulsory.**
2) Solve any **Three** questions out of remaining **Five** questions.

1. a) Explain different types of transparencies in distributed databases. **5**
   b) What is a view? Discuss the difference between a view and a base relation. **5**
   c) Explain Factless Fact Table. **5**
   d) Illustrate the concepts of embedded SQL. **5**

2. a) List and explain the operations on Files. **10**
   b) Create an ER model for a Railway system with following constraints: **10**
      i) Stations
      ii) Tracks, connecting stations. You can assume for simplicity that only one track exists between any two stations. All the tracks put together form a graph.
      iii) Trains, with an ID and a name
      iv) Train schedules recording what time a train passes through each station on its route. You can assume for simplicity that each train reaches its destination on the same day, and that every train runs every day. Also for simplicity, assume that for each train, for each station on its route, you store (a) time in, (b) time out (same as time in if it does not stop), and (c) a sequence number so the stations in the route of a train can be ordered by sequence number.
      v) Passenger booking consisting of train, date, from-station, to-station, coach, seat and passenger name; for simplicity, don't bother to model passengers as entities.

3. a) Explain the Object Database Concepts with: **10**
      i) Object identity
      ii) Type constructors
      iii) Type hierarchies and inheritance and
      iv) Extents
   b) Why is the entity-relationship modeling technique not suitable for the data warehouse? How is dimensional modeling different? What are hierarchies and categories as applicable to a dimension table? **10**

4. a) Design a schema in SQL for a Library System. Show one example each for Primary key and Foreign Key constraint. Create one suitable ECA example to enforce the Library constraint. **10**

b) Consider a data warehouse for a hospital, where there are three dimensions: **10**
i) Doctor, ii) Patient and iii) Time and
two measures i) Count and ii) Charge.
Using the above example describe the following OLAP operations
i) Rollup, ii) Drilldown iii) Slice iv) Dice and v) Pivot

5. a) Give three reasons why you think ETL functions are most challenging a data warehouse environment. **10**

b) Analyze the log after crash shown in Table-1 and briefly answer the following questions: **10**
i) What are the roles of the Analysis, Redo, and Undo phases in ARIES?
ii) What is done during Analysis? (Be precise about the points at which Analysis begins and ends and describe the contents of any tables constructed in this phase.)
iii) What is done during Redo? (Be precise about the points at which Redo begins and ends.)
iv) What is done during Undo? (Be precise about the points at which Undo begins and ends.)

Table 1: Log after a crash.

0	BEGIN CHECKPOINT
5	END CHECKPOINT (EMPTY XACT TABLE AND DPT)
10	T1: UPDATE P1 (OLD: YYY NEW: ZZZ)
15	T1: UPDATE P2 (OLD: WWW NEW: XXX)
20	T1: COMMIT

6. a) With suitable relational schema give at least two examples of Simple and Nested Queries. **5**

b) Explain in short the concerrency control in distributed databases. **5**

c) Explain Role-Based Access Control for Multilevel Security. **5**

d) Describe the following OQL concepts (**any two**): **5**
i) Database entry points,
ii) Path expressions,
iii) Iterator variables,
iv) Named queries (views),
v) Aggregate functions, grouping, and quantifiers.
