

Q.P. Code : 594500

(3 hours)

Marks : 80

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

1. (a) Explain Factless Fact table. 5
 (b) What is the role of Metadata in data warehouse? 5
 (c) Compare OLTP vs. OLAP. 5
 (d) Explain different types of transparencies in distributed database. 5
2. (a) Explain concurrency control in distributed database. 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 Discretionary access control based on granting and revoking Privileges. 10
 (b) Explain Star Schema. Draw Star Schema for Hospital Management. 10
4. (a) Explain Data warehouse architecture in detail. 10
 (b) Consider the following database that has to be distributed: 10

PROJ(PNO, PNAME, BUDGET)
 PAY(TITLE, SALARY)
 EMP(ENO, ENAME, SALARY)
 ASG(ENO, PNO, RESPONSIBILITY, DURATION)

 1. Show 2 examples of horizontal fragmentation
 2. Show 2 examples of vertical fragmentation
 3. Show 1 examples of derived fragmentation
 4. Show 1 examples of mixed fragmentation

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5. (a) Explain ETL phases in creating data warehouse. 10
(b) Explain indexing techniques in a database. 10
6. (a) Describe the following OQL concepts: 10
i) Database entry points,
ii) Path expressions,
iii) Iterator variables,
iv) Named queries (views),
v) Aggregate functions, grouping, and quantifiers.
- (b) We have an ordered file with 30000 records stored on a disk with block size 1024 bytes. File records are of fixed size and are unspanned, with record length $R = 100$ bytes. Ordering key field of the file is 9 bytes long, a block pointer is 6 bytes long and primary index has been constructed for the file. Find: 10
1. The Blocking factor bfr for the file.
 2. The number of blocks b needed for the file.
 3. The size of each index entry R_i .
 4. The blocking factor for the index bfr_i .
 5. The number of index blocks b_i .
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