GI 274/ GI 9204- INFORMATICS I / DATABASE SYSTEMS

Time : 3hrs   Max. Mark: 100

Draw neat sketches wherever necessary

Answer ALL Questions

Part-A (10 X 2 = 20 Mark)

1   What is a database management system (DBMS)?

2   Define schema and instance.

3   List databases based on modeling.

4   What is an index in database?

5   List the differences types of joins

6   Define Functional Dependency (FD).

7   What are the user roles in Oracle?

8   What is meant by view and sequence in Oracle?

9   What is the use of ODBC?

10 Give an example for XML that describes a table.

Part-B (5 X 16 = 80 Mark)

11   What is normalization? Explain how different normalizations will help in database design.   (16)

12.a   Notown Records has decided to store information about Musicians who perform on its albums (as well as other company data) in a database.   (16)

*   Each musician that records at Notown has an SSN, a name, an address and a phone number. Poorly paid musicians often share the same address. No address has more than one phone.

*   Each instrument that is used in songs recorded at Notown has a name (eg.Guitar, flute, etc..) and musical key (eg.C,B-flat,E-flat).

*   Each album that is recorded on the Notown label has a title, a copy right, a format (eg, CD or DVD), and an album identifier

*   Each song recorded at Notown has a title and an author.

- Each musician may play several instruments and a given instrument may be played by several musicians.
- Each album has a number of songs on it, but no song may appear on more than one album.
- Each song is performed by one or more musicians and a musician may perform a number of songs.
- Each album has exactly one musician who acts as its producer. A musician may produce several albums.

Design a conceptual schema for Notown and draw an ER diagram for the schema. Indicate all key and cardinality constraints and any assumption that you make. Identify any constraints that you are unable to capture in ER diagram and briefly explain why you could not express them.

(OR)

b. Classify the databases based on model, tools, usage, and server. (16)

13.a Explain sequential, index sequential and random file organizations with necessary examples. (16)

(OR)

b. Consider the following schema (16)

Supplier (sid: integer, sname: string, address: string)

Parts (pid: integer, pname: string, color: string)

Catalog(sid: integer, pid: integer, cost: real)

The key fields are underlined and domain is given after each field.

Write the following queries in relational algebra

- Find the names of suppliers who supply some red part.
- Find the sids of suppliers who supply some red or green part
- Find the sids of suppliers who supply some red and green part
- Find the sids of suppliers who supply every red part
- Find the sids of suppliers who supply every red or green part
- Find the sids of suppliers who supply every red part or supply every green part
- Find the pids of parts that are supplied by at least two different suppliers
- Find the cost of the red part supplied by "ABC company"

14.a.i Explain the database security issues in various stages of a database and suggest (8) necessary solution for the problems

ii Discuss types of failures and recoveries (8)

(OR)

b. Explain in detail about temporal, active and spatial databases (16)

15.a Consider the following schema

Supplier (sid: integer, sname: string, address: string)

Parts (pid: integer, pname: string, color: string)

Catalog(sid: integer, pid: integer, cost: real)

Write the SQL statements (16)

- to create the above three relations, including all primary key and foreign key integrity constraints
- to add a supplier
- to give discount of 10% on red part
- to find the names of suppliers who supply a red part or a green part
- to find part names supplied by "ABC Company"
- to find the number of red parts supplied by "ABC Company".

Or

b.i Explain oracle server-client environment with its utilities (8)

Ii Explain ODBC in VB to a table in Oracle (4)

Iii Explain how to create users with roles and privileges using SQL in Oracle. (4)