



## Database Management Systems [CSE2007 - 134]

Marks: 50

Duration: 90 mins.

### Part-A

Answer all the questions.

- 1) 1. Differentiate between (10)
  - a. File Systems and Database Systems (5)
  - b. Physical Data Independence and Logical Data Independence (2.5)
  - c. Database schema and Database state (2.5)
- 2) 2. Consider a MAIL\_ORDER database in which employees take orders for parts (10) from customers. The data requirements are summarized as follows:
  - The mail order company has employees, each identified by a unique employee number, first and last name, and Zip Code.
  - Each customer of the company is identified by a unique customer number, first and last name, and Zip Code.
  - Each part sold by the company is identified by a unique part number, a part name, price, and quantity in stock.
  - Each order placed by a customer is taken by an employee and is given a unique order number. Each order contains specified quantities of one or more parts. Each order has a date of receipt as well as an expected ship date. The actual ship date is also recorded.
 Design an entity-relationship diagram for the mail order database.
- 3) 3. Give a relational schema diagram for the following ER diagram. (10) Appropriately label the foreign key references with the corresponding foreign keys.
- 4) 4. a. Let a Relation R have attributes {a1, a2, a3} & a1 is the candidate key. (10)  
 Then how many super keys are possible? (5)  
 b. Why are duplicate tuples not allowed in a relation? Discuss with an example. (5) ?
- 5) 5. Consider the following schema (10)
 

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

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

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

Give an expression in RELATIONAL ALGEBRA for each request

  - a. Find the sids of suppliers who supply some red part and some green part. [2.5]
  - b. Find the sids of suppliers who supply every part. [2.5]
  - c. Find the sids of suppliers who supply some red part or are at 221 Parker street [2.5]
  - d. Find the names of suppliers who supply red parts that cost less than Rs.10000 [2.5]

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