June-July 2008

Bachelor of Computer Application (BCA) Examination

IV Semester

Data Base Management System

Time : 3 Hours] [Max. Marks : 40

Note : ***Attempt all questions, choosing any two parts of each question. Each question carries equal marks.***

1. (a) Explain the difference between data and information. Discuss the lack of date indepedence in file systems.

   (b) Discuss the importance of data modelling. And what is a business rule and what is its purpose in data modelling?

   (c) What are the steps in designing a database? How is data in a DBMS retrieved and manipulated?

2. (a) Use the following business rules to create a ER diagram. Write all appropriate connectivities and cordinalities in the E-R diagram :

   (i) A department employs many employees, but each employee is employed by one department.

   (ii) Some employees, known as ``rovers'', are not assigned to any department.

   (iii) A division operates many departments, but each department is operated by one division.

   (iv) An employee may be assigned many projects, and a project may have many employees assigend to it.

   (v) A project must have at least one employee assigned to it.

   (vi) One of the employees manages each department, and each department is managed by only one employee.

   (vii) One of the employees runs each division, and each division is run by only one employee.

   (b) What two conditions must be met before an entity can be classified as a weak entity? Give an example of a weak entity. What is a recursive relationship? Give an example.

   (c) Discuss the rules for reducing E-R schema to tables.

3. (a) Consider the following database :

Employee

Emp_cost	Emp_name	Job_code
14	Amit	2
15	Bhavesh	1
16	Charu	1
17	Gagan	3
20	Suresh	2

Benefit

Emp_code	Plan_code
15	2
15	3
16	1
17	1
17	3
17	4
20	3

Job

Job_code	Job_description
1	Clerical
2	Technical
3	Managerial

Plan

Plan_code	Plan_description
1	Term Life
2	Stock Purchase
3	Long-term Disability
4	Dental

(i) For each table in the database, identify the primary key and foreign key(s).

(ii) Do the tables exhibit entity integrity? Answer yes or no, then explain your answer.

(iii) Do the tables exhibit referential integrity? Answer yes or no; write ``Not Applicable'' if the table does not have a foreign key.

(b) What is a relation? Differentiate between a relation schema and a relation instance. What are domain constraints?

(c) Consider the following schema :

Suppliers (sid, sname, address)

Parts (pid, pname, color)

Catalog (sid, pid, cost)

Write the following queries in relational algebra :

(i) Find the names of suppliers who supply some red part.

(ii) Find the sids of suppliers who supply every part.

(iii) Find the pids of parts supplied by at least two different suppliers.

4. (a) Consider a relation R with six attributes ABCDEF. You are given the following dependencies :
$AB \rightarrow CDEF$, $B \rightarrow C$, $D \rightarrow F$
Convert the given relation into 3NF. Also write the definition of BCNF.

(b) Define functional dependencies. How are primary keys related to FDs? When is a decomposition said to be dependency preserving? Why is this property useful?

(c) What are triggers? Explain with example. Also write about the use of group by and having clause in SQL.

5. (a) Write short notes on any two of the following :
(i) Pitfalls in Relational Database Design.
(ii) ORACLE Tools.
(iii) Data Models.

(b) What is the role of Database Administrator? What is Transaction Control Language and its use?

(c) Draw the overall structure of DBMS.

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