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CS-06

BACHELOR OF COMPUTER APPLICATIONS
(Pre-Revised)

00734

Term-End Examination

December, 2014

CS-06 : DATABASE MANAGEMENT SYSTEMS

Time : 3 hours *Maximum Marks : 75*

Note : *Question number **1** is **compulsory** and carries 30 marks. Attempt any **three** questions from the rest.*

1. (a) Consider the following relations : *8*

Supplier (supplier_ID, supplier_name, supplier_city)

Parts (part_ID, part_name, project_ID)

Project (project_ID, project_name, project_city)

Supply (supplier_ID, part_ID, quantity)

In the tables given above, the assumptions are that a supplier supplies a part only for one particular project, and there is only one supply record for a supplier_ID and part_ID pair.

Write the SQL commands for the following queries :

(i) Create the table "Parts" and "Project" using suitable constraints.

(ii) Find the suppliers who have supplied to project whose name is "Database System Implementation".

(iii) Find the suppliers who supply the parts that are used in the project whose project_city is "Delhi".

(iv) Find the name of the supplier who has supplied the maximum quantity for a specific supply.

(b) A medicine store wants to keep track of all the medicine sales using a database system. A medicine can be treated as an item that has an expiry date and a batch number. Medicines are sold to two different kinds of customers : *10*

(i) Corporate customers

(ii) General customers

Corporate customers are given special discounts. Each medicine is supplied by a supplier, who has a registration number. A supplier can supply different medicines.

Perform the following tasks for the medicine store :

(i) List all the entities of interests and their attributes.

(ii) List all the relationships and their cardinalities.

(iii) Draw the E-R diagram.

(c) What is an object-oriented database system ? How are object-oriented database systems different from the relational database management systems ? Give an example situation where you will prefer object-oriented database system over a relational database management system. Justify your answer. *7*

(d) Consider the following instance of a Student relation : *5*

ID	Name	Programme	Course
1	Raman	MCA	CS-01
1	Raman	MCA	CS-02
2	Diya	MCA	CS-04
2	Diya	MCA	CS-05
3	Naman	BCA	BCS-01

List all the functional dependencies of the relation. What would be the candidate keys for the relation ?

2. (a) What is an Index ? Explain with the help of an example. What are the advantages of using B-Tree as index structure ? *6*

(b) Consider the following two relations : *9*

P :

A	B
a_1	b_1
a_1	b_2
a_2	b_1
a_3	b_1
a_4	b_2
a_5	b_1
a_5	b_2

Q :

B	C
b_1	c_1
b_1	c_2
b_2	c_2
b_2	c_3

Perform the following relational algebraic operations on the relations :

(i) $\sigma_{(A = a_1 \vee A = a_5)}(P)$

(ii) P Natural Join Q

(iii) $P \div \Pi_B(Q)$

3. (a) What are the issues of knowledge representation ? Explain one scheme of knowledge representation. *8*

(b) Explain the direct file organisation with the help of a diagram. *5*

(c) Define the term Entity Integrity constraint with the help of an example. *2*

4. (a) Why do you normalize a database ? Explain with the help of an example.

Consider the relation : *8*

Programme Structure

(programme_code, programme_name, course_code, course_name, course_credit, programme_duration)

Some of the related assumptions are :

A programme consists of many courses.

A course can be a part of many different programmes. You may make suitable assumptions, if any.

Normalise the relation given above into 3NF. Show all the possible steps.

(b) What are the advantages of using client-server database system ? *3*

(c) Define the three-level architecture of DBMS. What is its purpose ? *4*

5. Explain the following terms with the help of an example/diagram : *5×3=15*

(a) Referential Integrity Constraint

(b) Views and their purpose in RDBMS

(c) Data Replication in Distributed Database Management System

(d) Limitations of RDBMS

(e) Data Independence in Database Systems