

BCA (Pre-revised)

Term-End Examination | 01684

June, 2014

CS-06 : DATABASE MANAGEMENT SYSTEM

Time : 3 hours

Maximum Marks : 75

Note : Question number 1 is compulsory. Attempt any three questions from the rest.

1. (a) Consider the following relations : 8

Student (*Id*, name, phone, programmecode, regioncode)

Programme (*programmecode*, programme name, numberofyears)

Region (*regioncode*, ~~region-name~~, address)

Courses (*programmecode*, *course-code*, course name)

Assume that a course can be part of only one programme. Write the SQL commands that performs the following queries :

- (i) List the *courses* for which student, whose *Id* is 0001, is registered.
- (ii) Find the total number of students registered in a each Region.
- (iii) List the MCA students of the regional centre whose name is "Delhi RC-I".
- (iv) List all the courses of BCA programme in alphabetical order of course names.

(b) A University has many employees. Some of these employees are part-time employees. The University has many departments. A full time employee works in a department. A part-time employee is not allocated to any department but are put in a pool of workers. A part time employee, therefore, may be asked to work in different departments at different time. Each department is headed by a head of the department (HOD) who is one of the full time employee. Each department has a budget, which is managed by the HOD. Perform the following tasks for the University. 10

(i) Identify the entities of interest, their attributes and primary key.

(ii) Identify the relationship sets among the entities.

(iii) Draw an ER diagram for the University showing entities, relationships, attributes, cardinality etc.

(c) What are the short coming of relational database management systems ? How are the RDBMS different to object oriented database management systems ? 6

- (d) Consider the following instance of a relation R. 6

A	B	C
a ₁	b ₁	c ₁
a ₁	b ₂	c ₁
a ₂	b ₁	c ₂
a ₂	b ₂	c ₂

- (i) List all the functional dependencies that can be identified in this instance of R.
- (ii) Find the candidate keys of R.
- (iii) Decompose the relation into 2nd normal form.

2. (a) Consider the relations : 6

Student (*Id*, name, pcode)
Programme (pcode, programmename, duration)

State the entity integrity and referential integrity constraints. Using the two relations explain the entity integrity and referential integrity constraints.

- (b) Consider that you need to represent information about a study centre as study centre code, study centre name, address, city, co-ordinator name and telephone numbers. How will you represent this information at : 5
- (i) External level
- (ii) Conceptual level
- (iii) Internal level.
- (c) What is client - server computing ? What are its advantages ? 4

3. (a) Consider the following information

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Faculty ID	Name	Area of expertise	Telephone nos.
1	Sanjay	DBMS Networks	292711 692311
2	Rajeev	TOC Discrete Maths	331122
3	Sanjeev	Networks Software Engineering	311311

Convert the table given above into first normal form.

Normalise the (INF) relation so created upto 3rd normal form. Make suitable assumptions, if any. Show all the steps.

(b) Explain the BCNF with the help of an example. 5

(c) List any 4 differences between database systems and knowledge base systems. 4

4. (a) Explain the concept of horizontal and vertical fragmentation in a distributed database management system with the help of an example. Why do you fragment a distributed database ? 6

(b) Explain the term "Data Independence" in the context of Database Systems with the help of an example. 5

(c) "A secondary key index is more advantageous than primary key index". Is the statement true ? Justify your answer. 4

5. Explain the following with the help of an example/diagram, if needed : 15
- (a) Index Sequential file
 - (b) Direct file organisation
 - (c) Object Oriented Database Systems and their applications
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