

BCA (Pre-revised)
Term-End Examination
December, 2012

CS-06 : DATABASE MANAGEMENT SYSTEM

Time : 3 hours

Maximum Marks : 75

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

1. (a) Assume the following requirements for a Library Database. 10

A Library maintains books on various subjects. It keeps records of Books like title, author(s), publisher, year of publication, cost. It has three kinds of memberships. Full members, temporary members and guest members. Full members can get maximum 12 books issued at a time, while temporary members can get only 6 books issued at a time. Guest members cannot get any books issued on their name. The Library also stores journals and magazine. Every Journal and magazine has a volume no., issue no. and name. Any member can only read the journal/magazine in library itself i.e Journal/Magazine cannot be issued.

Library is administered by Librarian with the help of staff members and keep track of library usage by its members.

Design an ER Diagram indicating all entities attributes with keys and cardinality ratios.

- (b) Explain the significance of normalisation. Define 1NF, 2NF, 3NF and BCNF with examples. **10**
- (c) Consider a B-tree of order five. Demonstrate the process of deleting a key from this B-tree. **5**
- (d) What is a join operation in relational algebra. How join (\bowtie) is related to cartesian product and selection operation. Library is administered by Librarian with the help of staff members and keep track of library usage by its members. On the basis of the above specifications answer the following questions : **5**
- (i) Design an ER diagram indicating all entities, attributes with keys and cardinality ratios.
- Note** : Make and state necessary assumptions if any.
2. (a) Explain the advantages and disadvantages of data distribution in Distributed Databases. **6**

- (b) What is a Knowledge Base System? Explain its various components. How does a knowledge base system differ from a database system? Give at least four differences. 9
3. Consider the following relations with key underlined :
- Address (person/name, street, city)
- Works (person/name, company-name, salary)
- Located (company/name, city)
- Manages (person/name, manager-name)
- Write SQL queries for the following :
- (a) Find the names and city of persons who work for manager 'AKSHAY'. 3
- (b) Find the names of persons who live in the same city as the company they work for. 3
- (c) Change the manager of 'Ramesh' from 'Akshay' to 'Mahesh'. 2
- (d) Delete the name of Rajesh. 2
- (e) Create a view Bangwork (person-name, company-name, manager-name) of all people who work in a city 'Delhi' in ascending order of person name. 5
4. (a) How is hierarchical model different from network model? Describe the process of accessing of data in each model. 5
- (b) Explain the Index Sequential file Organisation. 4

- (c) Consider the universal relation $R=(A, B, C, D, E, F, G, H, I, J)$ and the set of functional dependencies F as given below : **3+3**

$F=\{ AB \rightarrow C, A \rightarrow DE, B \rightarrow F, F \rightarrow GH, D \rightarrow IJ\}$

- (i) Determine the key for R .
(ii) Decompose R into second normal form.

5. Write a short note (**150 words**) on the following :

- (a) Object oriented DBMS. **3x5=15**
(b) Functions of Database Administrator.
(c) Client/server Database Architecture.
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