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CS-06

BACHELOR OF COMPUTER APPLICATIONS (BCA) (Pre-Revised)

Term-End Examination

00755

June, 2018

CS-06 : DATABASE MANAGEMENT SYSTEMS

Time : 3 hours *Maximum Marks : 75*

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

1. (a) Consider the following case :

A bank maintains information about customers and their accounts. Each customer has a name, address (house no., area, city and state code) and telephone number. The account has number, type and balance. We need to record customers who own an account in the bank. Account can be operated individually or jointly. Design and draw an ER diagram, clearly indicating the attributes, keys, cardinality ratio and participation constraints. *7*

(b) What is the need of indexing in DBMS ? Explain the significance of Primary index with the help of an example. *5*

(c) What are the different types of anomalies which a relational database can encounter ? How does normalisation help in avoiding these anomalies ? 5

(d) Discuss the three level architecture of DBMS. Explain how it leads to data independence. 7

(e) What is a view ? Explain with the help of an example. Also specify the five conditions that a view must meet in order to allow updates. 6

2. (a) Construct a B+ tree for the following set of key values where the number of key values that fit in a node is 3.

Key values : (22, 12, 15, 14, 23, 45, 17, 8, 9, 1, 3).

Show the steps involved in deletion of key values 8 and then 17. 8

(b) Why is BCNF a more desirable normal form than any of the lower order normal forms ? Give an example of a relational schema that is in 3NF but not in BCNF. 7

3. (a) What is Data Fragmentation ? Differentiate between Horizontal and Vertical Fragmentation with the help of an example. 8

(b) With the help of an example, explain the inverted file organization. 3

(c) What are integrity constraints ? Explain any two types of integrity constraints which can be imposed on relational databases. *4*

4. (a) Consider the following relations : STUDENT (S_name, Roll_No, Teacher_Id, Programme, Semester, Subject) *8*

DEPARTMENT (Dep_Id, Programme, Teacher_Id)

TEACHER (Teacher_Id, Dep_Id, Teacher_name, Subject)

Write the following queries using SQL :

(i) List name of all the teachers who belong to Dep_Id = '4' and take subject 'Automata'.

(ii) List names of all the students who study in Semester-II of BCA programme and are taught by Teacher_Id = '6'.

(iii) Find the names of all teachers who teach the student with Roll_No = '56'.

(iv) Find the names of all students who are in Semester-II of the BCA programme and are taught by Prof. Kumar.

(b) How is Serial Schedule different from Serializable Schedule ? What are the problems associated with both schedules ? How will you identify that a schedule is serializable or not ? Explain with the help of an example. *7*

5. Write short notes on the following : *3×5=15*

(a) Distributed DBMS

(b) Index Sequential File Organisation

(c) Difference Between Knowledge Based System and Database System