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MCS-043

MCA (Revised)

Term-End Examination

December, 2017

04350

MCS-043 : ADVANCED DATABASE MANAGEMENT SYSTEMS

Time : 3 hours *Maximum Marks : 100*

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

1. (a) How does Data-mining differ from the technique of Knowledge Discovery in Databases (KDD) ? Can we use these two techniques interchangeably or alternatively ? Justify. *5*

(b) Explain the index implementations available in PostgreSQL, with suitable examples. *5*

(c) Consider the following data :

Employee Code (EC)	Project Code on which employee works (PC)	Tools that employee can work on (TC)
E1	P1 P2	T1 T2
E2	P3 P4	T2 T3

Employee with code E1 works on two projects, P1 and P2, and can use two tools T1 and T2. Likewise, E2 works on projects P3 and P4 and can use tools T2 and T3. You may assume that projects and tools are independent of each other, but depend only on employee.

Perform the following tasks for the data :

(i) Represent the data as above in a relation, namely,

Employee_Project_Tool (EC, PC, TC). 2

(ii) List all the MVDs in the relation created in part (i) above. Also identify the primary key of the relation. 3

(iii) Normalise the relation created in part (i) into 4NF. 3

(iv) Join the relations created in part (iii) above and show that they will produce the same data on joining as per the relation created in part (i). 2

(d) What is Granularity in databases ? How does granularity relate to the security of databases ? In a concurrent environment, how does granularity affect the performance ? 5

(e) What are Semantic databases ? Give the features of semantic databases. Discuss the process of searching the knowledge in these databases. 5

(f) Illustrate the concept of Shadow Paging with suitable example. Give the advantages and disadvantages of shadow paging. 5

(g) How does Clustering differ from Classification ? Briefly discuss one approach for both, i.e., clustering and classification. 5

2. (a) What are Alerts, Cursors, Stored Procedures and Triggers ? Give the utility of each. Explain each with suitable code of your choice. 10

(b) What is Simple Hash Join ? Discuss the algorithm and cost calculation process for simple hash join. Explain how Hash join is applicable to Equi join and Natural join. 10

3. (a) Differentiate between the following :

(i) Database Queries and Data-mining Queries

(ii) Star Schema and Snowflake Schema

Give example for each while differentiating. 10

(b) What are Deadlocks ? How are they detected ? Explain with the help of an example. 5

(c) What are Mobile Databases ? Explain the characteristics of mobile databases. Give an application of mobile databases. 5

4. (a) What are Views in SQL ? What is the significance of views ? Give an example code in SQL to create a view. 5

(b) (i) Create an XML document that stores information about students of a class. The document should use appropriate tags/attributes to store information like student_id (unique), name (consisting of first name and last name), class (consisting of class no. and section) and books issued to the student (minimum 0, maximum 2). Create at least two such student records. 6

(ii) Create the DTD for verification of the above student data. 4

(c) Explain the features and challenges of multimedia databases. 5

5. (a) What is Data Dictionary ? Give the features and benefits of a data dictionary. What are the disadvantages of a data dictionary ? 8

(b) What is the utility of Multi-Version schemes in databases ? Discuss any one multi-version scheme, with suitable example. 5

(c) What is Association Rule Mining ? Write Apriori Algorithm for finding frequent itemset. Discuss it with suitable example. 7