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0520MCA102072102

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Second Semester MCA (2 Years) Degree Examination July 2021

Course Code: 20MCA102

Course Name: ADVANCED DATABASE MANAGEMENT SYSTEMS

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1 Differentiate logical data independence and physical data independence. (3)

2 With the help of an example, explain generalization and specialization in extended ER features. (3)

3 Define multivalued dependency and the related normal form with an example. (3)

4 Write down the inference rules for functional dependencies used in database normalisation. (3)

5 Discuss the ACID properties of a transaction. (3)

6 How does it implement concurrency control using timestamp method? (3)

7 Discuss any two RAID levels with diagram. (3)

8 Prepare a note on dense index and sparse index with example. (3)

9 Compare homogenous and heterogenous distributed databases. (3)

10 Explain array and multiset types in in SQL. (3)

PART B

Answer any one question from each module. Each question carries 6 marks.

Module I

11 Construct an Entity-Relationship Diagram for a database of research projects. (6)

The database should contain the information about the following

Projects : name, manager, budget, duration (in years), funding agency

Employees : SSN, name, projects, salary¡

Each project is funded by a single agency. Project names are unique within an agency. An employee can be associated with several projects. Managers are

employees. You can make other additional assumptions that make sense in the real world.

OR

12 Identify the additional operations of relational algebra with suitable example. (6)

Module II

13 Discuss the anomalies at different levels of normalization with example. (6)

OR

14 Describe the informal design guidelines for relational databases. (6)

Module III

15 Explain why concurrency control mechanism needed in transaction management. (6)

OR

16 Define lock granularity and explain different levels of locking methods for concurrency control. (6)

Module IV

17 Elaborate on different file organization methods in data storage. (6)

OR

18 Explain the structure and search operation of a B+ Tree with an example. (6)

Module V

19 Explain about non-relational distributed databases. (6)

OR

20 Discuss about MongoDB sharding and replication. (6)

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