G 3532

M.C.A. DEGREE EXAMINATION, MAY/JUNE 2007.

Second Semester

MC 1654 — DATABASE MANAGEMENT SYSTEMS

(Regulation 2005)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Compare Database systems with File systems, highlighting any two issues.

2. Define Relational Model with a simple example.

3. Explain any two set operations in relational algebra.

4. Explain the terms: Key constraint; candidate key.

5. Sketch the structure of a disk and label the components involved in it.

6. What is RAID and what are its advantages?

7. Define access path with reference to query processing.

8. When do you use the JOIN operation? Specify its format.

9. What do you mean by serialisability?

10. Briefly explain the phenomenon of deadlock, as applied to concurrency control.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Highlight the important advantages of a Database Management System(DBMS). (6)

(ii) What are data models? Explain the three levels of abstraction in a DBMS system. (10)

Or

(b) (i) Describe the structure of a DBMS system with a block diagram. (12)

(ii) Explain the feature of aggregation in E-R models. (4)

12. (a) (i) Explain three basic Set Operations of SQL query operations with an example. (6)

(ii) Elaborate on the concepts of Embedded SQL and Dynamic SQL components of SQL. (10)

Or

(b) (i) What are triggers? Explain the mechanism of operation of the triggers with relevant examples. (12)

(ii) What are the pitfalls in relational-Database Design? (4)

13. (a) Explain the concept block-level striping as applied to RAID. Also, explain the different levels of RAID, adopted in performance improvement of disk operation. (16)

Or

(b) (i) Explain the structure of a B Tree index, with the help of an example. (6)

(ii) Describe the B^+ Tree based File Organisation method. (10)

14. (a) (i) Explain the steps in a query processing sequence. (6)

(ii) Explain the external sort-merge algorithm for sorting of database. (10)

Or

(b) (i) Discuss briefly the following ways of evaluation of expressions: Materialisation; Pipelining. (8)

(ii) Illustrate Heuristic Optimisation method, with an example. (8)

15. (a) (i) State the four important properties of transactions that a DBMS must support, to take care of concurrent access and system failures. (4)

(ii) What is lock based concurrency control? Explain the Strict Two-Phase Locking used for concurrency control. (12)

Or

(b) Describe in detail the shadow paging technique adopted in crash recovery systems. (16)
