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K 6138

M.E. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Elective

Computer Science and Engineering

CS 1638 — ADVANCED DATABASES

(Common to M.E. Software Engineering)

(Regulation 2005)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Distinguish between persistent and transient objects.
2. Distinguish between a relationship instance, relationship type, and relationship set.
3. What is an equijoin? How can it be executed between two files located at different sites? How is the cost of data transfer computed?
4. What is a fragment of a relation? Explain fragmentation in the context of DDBMS.
5. Distinguish between structured, semistructured, unstructured data.
6. Distinguish between the use of tags in XML and HTML.
7. What is the method for encapsulation of operations in SQL?
8. What is an active database? Distinguish between row-level and statement-level active rules.
9. What is a digital signature? Mention its applications.
10. Define the term database tuning.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Define normalization. What is its significance? (4)
(ii) Distinguish between specialization hierarchy and specialization lattice. (6)
(iii) Differentiate ODBC and JDBC. (6)

Or

- (b) (i) Explain the usefulness of a high-level data model in the database design process. (6)
(ii) What is a structural constraint? Describe two methods for specifying structural constraints on relationship types. Discuss their relative merits and demerits. (10)

12. (a) (i) Write a short note on the ODMG object model. (4)
(ii) What is an OID? Discuss the primary characteristics of an OID. (6)
(iii) Discuss on ROLAP and MOLAP. (6)

Or

- (b) (i) Discuss the different approaches to storing XML documents in databases. (10)
(ii) What is Data Mining? Explain any one mining algorithm for categorical data (6)

13. (a) (i) Explain query decomposition. Discuss the use of guard conditions and attribute lists of fragments in query decomposition. (8)
(ii) Discuss the need for and advantages of distributed databases. (4)
(iii) Explain about controlled redundancy in the context of distributed databases (4)

Or

- (b) (i) Discuss the differences in concurrency control and recovery in centralized databases and distributed system. (8)
(ii) Explain TP monitor in Distributed Environment. (8)
14. (a) (i) Discuss the chief software modules of a DDBMS. How are they related to a client-server architecture? (8)
(ii) For each of the following schedules, indicate if the schedule is conflict-serializable or not. If a schedule is conflict serializable, specify an equivalent serial schedule. Otherwise, draw the precedence graph for the schedule and indicate a cycle in the graph. (To specify a serial schedule just list the ordering of the transactions in the schedule.)

- (1) r1 (A), w1 (B), r2 (B), w2 (C), r3 (C), w3 (A)
- (2) w3 (A), r1 (A), w1(B), r2 (B), w2 (C), r3 (C)
- (3) r1 (A), r2 (A), w1(B), w2 (B), r1 (B), r2 (B), w2 (C), w1 (D)
- (4) r1 (A), r2 (A), r1 (B), r2 (B), r3 (A), r4 (B), w1 (A), w2 (B) (8)

Or

- (b) (i) Write short notes on two-phase commitment (2PC) protocol. (8)
 - (ii) Discuss the following: (8)
Degree of homogeneity of a DDBMS, degree of local autonomy of a DDBMS, federated DDBMS, distribution transparency.
15. (a) (i) Discuss in detail the classification of database management systems. (8).
- (ii) Discuss about various levels of security provided in a Database Management System. (8)

Or

- (b) (i) Write short notes on digital signatures. (6)
- (ii) What is meant by Database Tuning? Explain various techniques of tuning a database. (6)
- (iii) How Integrity is maintained in Distributed Databases? (4)