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Question Paper Code: 41425

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2016

Fourth Semester

Computer Science and Engineering

14UCS405 - DATABASE MANAGEMENT SYSTEMS

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- _____ users form their requests in a database query language.
(a) Naïve (b) Sophisticated (c) Specialized (d) Programmer
- _____ represent relationship sets in ER diagram
(a) Diamonds (b) Rectangles
(c) Double diamonds (d) Lines
- Which SQL statement is used to extract data from a database?
(a) SELECT (b) OPEN (c) EXTRACT (d) GET
- _____ allows individual row operation to be performed on a given result set or on the generated by a selected statement.
(a) Procedure (b) Trigger (c) Cursor (d) None of these
- _____ property keeps track of old values if failure happens, it restores the old values to make transaction rolled back.
(a) Durability (b) Atomicity (c) Isolation (d) Consistency

6. If a transactions T_i has obtained _____ lock on item Q, then T_i can read, but cannot write Q
 - (a) Shared mode
 - (b) Exclusive mode
 - (c) Unshared mode
 - (d) None of these
7. _____ indices is based on the uniform distribution of values across a range of buckets
 - (a) Ordered
 - (b) Hash
 - (c) Dense
 - (d) Sparse
8. What is the minimum number of disks required for RAID1?
 - (a) 1
 - (b) 2
 - (c) 4
 - (d) 5
9. _____ is a repository of information gathered from multiple sources stored under unified schema at a single site
 - (a) Database
 - (b) Data mining
 - (c) Data Warehouse
 - (d) Spatial database
10. XML uses _____ storage, which uses varchar(max) and varbinary(max).
 - (a) Small object
 - (b) Large object
 - (c) Native
 - (d) None of these

PART - B (5 x 2 = 10 Marks)

11. A relation NADDR is defined as follows.
 NADDR = (name, street, city, state, postal_code)
 where name is unique, and for any given postal code, there is just one city and state.
 Identify whether the above relation is in 2NF or in 3NF
12. Define ACID property.
13. Why transactions are executed concurrently?
14. List the benefits and limitations of a data warehouse.
15. Illustrate about data classification.

PART - C (5 x 16 = 80 Marks)

16. (a) A University Registrar's office maintains data about the following entities:
- (i) courses, including number, title, credits, syllabus, and prerequisites;
 - (ii) course offerings, including course number, year, semester, section number, instructor(s), timings, and classroom;
 - (iii) students, including student-id, name, and program;
 - (iv) instructors, including identification number, name, department, and title.

Further, the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled. Construct an E-R diagram for the Registrar's office. (16)

Or

- (b) (i) Explain the different kinds of data models. (8)
- (ii) Explain Boyce-Codd normal form with example and also compare BCNF and 3NF. (8)
17. (a) (i) What is meant by heuristic optimization? Discuss the main heuristics that are applied during query optimization. (8)
- (ii) Differentiate static SQL and dynamic SQL. (8)

Or

- (b) (i) Examine the steps involved in query processing. (8)
- (ii) List out the different selection operations involved in query processing. (8)
18. (a) (i) List the various states through which a transaction passes through in its lifetime. Briefly discuss all the events that cause transition from one state to another. (8)
- (ii) Identify the occurrence of deadlock in a system. Explain the two approaches to prevent deadlock. (8)

Or

- (b) (i) Explain all effects of concurrency in terms of the 3 problems which may occur in a process. (8)

(ii) Consider the following two transactions

T1 : read (A);
 read (B);
 B = A + B;
 write (B)
T2 : write (A)
 read (B)

Add lock and unlock instructions so that the transaction T1 and T2 observe two-phase locking protocol. Is it deadlock free? (8)

19. (a) (i) Describe the different RAID levels. Discuss the choices of the different RAID levels for different applications. (8)
- (ii) Define ordered indexing and hashing. Also differentiate between the two. (8)

Or

- (b) (i) Describe the algorithm for updating indices for a single level index when a record is
- (i) Inserted (ii) deleted
- What will be the modification if there are multilevel indices? (8)
- (ii) Differentiate between static hashing and dynamic hashing. (8)

20. (a) Explain in detail the database security. (16)

Or

- (b) (i) Illustrate the advantages and disadvantages of distributed database. (8)
- (ii) Describe about crawling and indexing the web. (8)