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Paper Code : MCA-403

DATABASE MANAGEMENT SYSTEM-II

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

i) Suppose R is a relation of n attributes $\{A_1, A_2 \ldots\ldots A_n\}$ as a function of n. How many super keys R has if the only key is A_1?

a) 2^*n b) $2^*(n-1)$

c) 2^{n-1} d) None of these.

ii) 4 NF differs from BCNF in only the use of MVD instead of

a) Super key

b) Candidate key

c) Functional dependency

d) Non-trivial.

iii) For relation $r_1(\underline{A}, B, C)$, $r_2(\underline{C}, D, E)$ and $r_3(\underline{E}, F)$, assume that r_1 has 1000 tuples, r_2 has 1500 tuples and r_3 has 750 tuples. Maximum size of $r_1 \bowtie r_2 \bowtie r_3$ is

a) 1000 tuple b) 750 tuple

c) 1500 tuple d) 1500750 tuple.

iv) Which of the following ensures that the system will never enter into a deadlock ?

a) Deadlock detection protocol

b) Timestamp ordering protocol

c) Two-phase locking protocol

d) None of these.

v) A serializability order of the transaction can be obtained through

a) Quick sort b) Topological sort

c) Selection sort d) Merge sort.

vi) Block-interleaved distributed parity is RAID level

a) 2 b) 3

c) 4 d) 5.

vii) Immediate database modification technique uses

a) Both undo and redo

b) Undo but no redo

c) Redo but no undo

d) Neither undo nor redo.

viii) Which of the following is not a consequence of concurrent operations ?

a) Lost update problem b) Update anomaly

c) Unrepeatable read d) Dirty read.

ix) Fetching past the last row of a cursor raises

a) NO_DATA_FOUND exception

b) VALUE_ERROR exception

c) CURSOR_NOT_FOUND exception

d) No exception.

x) A statement that is executed automatically by the system a side effect of the modification of the database is

a) Backup b) Assertion

c) Recovery d) Trigger.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Is the given schedule S both recoverable and cascadeless ? Give reasons for your answer.

$S : r_1(A), r_2(B), w_1(A), r_2(A), w_2(A), r_3(A), w_3(A), w_1(B), c_1, a_2$

3. Define trivial multi valued dependency and trivial join dependency. "MVD is a special case of JD". Justify the statement. 3 + 2

4. Write the basic steps to create an explicit cursor.

5. What is lost update problem ? What is phantom problem ? 3 + 2

6. Discuss Thomas Write rule.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. Define lock. What is binary lock ? What is the basic mechanism for implementing isolation of transaction using binary lock ? Why does 2PL not guarantee freedom from deadlock ? Discuss the different levels of lock granularity. 2 + 2 + 4 + 4 + 3

8. Define cursors in database. What is active data set ? What are the different parts of a database trigger ? Why cannot we include triggers in database packages ? Consider a relation EMP (ename, eno, sal, job). Write PL/SQL application that would prevent any negative input for the field sal for the given relation using database trigger. 2 + 2 + 3 + 3 + 5

9. Discuss log based recovery system. Differentiate between deferred modification and immediate database modification. Give your view point on the different types of database integrity. How does foreign key referentially integrate database tables. 3 + 3 + 6 + 3

10. With a suitable diagram discuss the referential architecture of distributed database management system. Give a comparative study of the different levels of transparency in DDBMS. How does an auxiliary program help in fetching data in a DDBMS ? 6 + 6 + 3

11. Write notes on the following (any *three*) : 3 × 5

a) Multi Valued Dependency

b) Shadow paging

c) Wound and wait *vs* Wait and die scheme

d) Write ahead log protocol

e) Transaction states.