Computer science. (87)

IV- Database Management system. II

QP Code : **05137**

(2½ Hours) [ Total Marks : 75

**N.B.** (1) **All** questions are **compulsory.**
(2) **Figures** to the **right** indicate **marks.**
(3) **Illustrations, in-depth answer** and **diagrams** will be **appreciated.**
(4) Mixing of **sub-questions** is not **allowed.**

1. Attempt the following (any **three**) :— 15
   (a) Explain decomposition consider the attribute set R = A B C D E G H and FDs set F = { AB → C, AC → B, AD → E, B → D, BC → A, E → G } List and explain which Armstrong's Axioms will be applicable here.
   (b) Describe the type of dependencies occur in Fourth and Fifth Normal Form.
   (c) What is the phantom problem ? Can it occur in a database where the set of database objects is fixed and only the values of objects can be changed ? Explain it with an example.
   (d) Consider a database with objects X and Y and assume and there are two transactions T1 and T2. Transaction T1 reads objects X and Y and then writes object X. Transaction T2 reads objects X and Y and then writes objects X and Y.
      (i) Give an example schedule of actions of transactions T1 and T2 on objects X and Y that results in a write-read conflict.
      (ii) Give an example schedule with actions of transactions T1 and T2 on objects X and Y that results in a read-write conflict.
   (e) Elaborate on, a DBMS must ensure four important properties of transactions to maintain data in the face of concurrent access and system failures.
   (f) Comment on – Two actions on the same data object conflict if at least one of them is an in consistent state.

2. Attempt the following (any **three**) :— 15
   (a) Define : granularity, deadlock, recovery manager.
   (b) Describe the steal and no-force policies.
   (c) Explain conflict equivalent and conflict serializale schedules.
   (d) State and justify the Thomas Write Rule.
   (e) What is trail known as ? Explain the contents of update log record.
   (f) What is ARIES ? Explain the phases.

3. Attempt the folowing (any **three**) :— 15
   (a) Elaborate on data types, variables and literals in PL / SQL by giving example.
   (b) Write a PL / SQL block to find factorial of a number which is accepted from the table facts (num, fact) and store it under fact in the given table.
   (c) Write a short note on conditional control in PL / SQL.
   (d) Explain the looping statement in PL / SQL using 'exit' statement by giving an example.
   (e) Write a PL / SQL block to accept the owner name from the user. The user name can be SYS, SYSTEM, HR or SCOTT. If the owner name is SYS then print the result as 'The Owner is SYS'. If the owner name is SYSTEM then print the result as 'The Owner is SYSTEM'. In the same manner print the result using CASE statement for other owners.
   (f) Write a short note on nested tables.

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4. Attempt the following (any three) :— 15

(a) Assuming a table accounts (acctno, acct-payees-name, balance). State and explain the queries to generate acctno using sequence. How to show the next generated and current value of sequence ?

(b) What is metadata ? What metadata is stored in system catalog ? Describe the information stored per relation.

(c) Write a PL / SQL block to execute the transaction operation as either D(Debit) OR C(Credit). Assuming Account-details (acctno, balance) ; if operation 'C' is executed, then transaction-amount can be credited to the bank. If operation 'D' is executed, the transaction-amount can be debited from bank. The transaction-amount and operation are accepted from the user. Make the changes in acct-updt (acctno, trans-date, operation, updated-balance)

(d) Explain the types of cursor. Write any two differences between the types of cursor.

(e) Elaborate on, commit, rollback and savepoint by giving these statements in queries.

(f) Define lock in SQL. Elaborate on the types of Locks with an example.

5. Attempt the following (any three) :— 15

(a) State and elaborate on the desirable properties of decomposition.

(b) Elaborate on validation conditions in optimistic concurrency control.

(c) Write a PL / SQL block to accept job from employee (empno, emp-name, salary, job, tot-salary) table. Assume that this table is already created. Give the following raise in salary.

→ by 9% if the job is clerk

→ by 8% if the job is Accountant

→ by 7% if the job is Executive, update the total-salary in the table employee.

(d) Write a PL / SQL block to find the total amount to be paid for the book "Black Book of Oracle log" using book (bookid, bookname, book-title, price) ordered by customer through bookorders (orderno, dateoforder, quantity). This order is made by a customer for a certain quantity. All the data should be taken from the above tables, assuming the tables are created already.

(e) Define the terms : atomicity, consistency, isolation, unrepeatable read, serializable schedule.

(f) Explain by giving an example, how cursor for loop is different from the normal cursor.