DBMS END TERM EXAM

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19BCS029

1) The company XYZ intends to store it's employee data in a heap file with a clustered index on the empname field. It is to be noted that a heap is a table with no clustered indices. Data is stored without specifying any order to store the row efficiently.

Thus, it is not possible to store data in a heap file with a clustered index in a field. Alternatively, it is completely possible to store the data with an index on empid field because it eventually becomes a primary index and thus, non-clustered indices are allowed in heap ~~files~~ files.

2) (i) DDL is important in Representing information in DBMS because it is used to describe External and logical schemes.

(ii) DML is used to modify and manipulate data; it is not important for Representing the data.

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3) TRUE

Justification:-

A DBMS is typically shared among users. Transactions from these users can be interleaved to improve the execution time of user's queries.

By interleaving queries, users donot have to wait for other users transactions to complete before their own transaction begins

Without interleaving, if user A begins a transaction that will take 10 seconds to complete, and user B would have to wait an additional 10 seconds for user A's transaction to complete before the database would begin processing user B's request

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4)

a) A user must guarantee that his or her transaction does not corrupt data or insert nonsense in the database.

For example, in a banking database, a user must guarantee that a cash withdraw transaction accurately models the amount a person removes from his or her account. A database application would be worthless if a person removed Rs. 1500/- from an ATM but the transaction set their balance to zero.

b) A DBMS must guarantee that transactions are executed fully and independently of other transactions. An essential property of a DBMS is that a transaction should execute automatically, or as if it is the only transaction running. Also, transactions will either complete fully, or will be aborted and the database returned to it's initial state. This ensures that the database remains consistent.

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5) Yes, we can determine the key of relation with the help of instance. e.g. In a one to many relation we can consider the column or attribute with unique values as a primary key.

6)

a) Create clustered index IX_empname_index ON

STUDENT TABLE (studentName DESC)

"Select Email from STUDENTTABLE

This query displays all the Emails in the descending order of the StudentName. First the table gets sorted based on studentname in DESC order and then the select query displays the emails in that order.

b)

Student ID	Student Name	Email	Age
1005	Krishna	Krishna@pg1.com	22
1030	John	Null	23
1020	John	Jk@xyz.com	22

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7)

$\rho(R_1, Catalog)$

$\rho(R_2, Catalog)$

$\Pi_{R_1.pid}\ \sigma_{R_1.pid = R_2.pid \wedge R_1.sid != R_2.sid}(R_1 \times R_2)$

Using:

SID	PID	Cost(Rs.)
1	1	600
2	1	550
2	3	2000
3	1	650

$R_1 \times R_2$ gives:

SID	PID	Cost (Rs)	SID	PID	Cost (Rs)
1	1	600	1	1	600
1	1	600	2	1	550
1	1	600	2	3	2000
1	1	600	3	1	650
2	1	550	1	1	600
2	1	550	2	1	550
2	1	550	2	3	2000
2	1	550	3	1	650
2	3	2000	1	1	600
2	3	2000	2	1	550
2	3	2000	2	3	2000
2	3	2000	3	1	650
3	1	650	1	1	600
3	1	650	2	1	550
3	1	650	2	3	2000
3	1	650	3	1	650

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$\sigma_{R_1.pid = R_2.pid}$ gives:

SID	PID	Cost(Rs)	SID	PID	Cost(Rs)
1	1	600	1	1	600
1	1	600	2	1	550
1	1	600	3	1	650
2	1	550	1	1	600
2	1	550	2	1	550
2	1	550	3	1	650
2	3	2000	2	3	2000
3	1	650	1	1	600
3	1	650	2	1	550
3	1	650	3	1	650

$\sigma_{R_1.pid = R_2.pid \wedge R_1.sid != R_2.sid}$ gives.

SID	PID	Cost(Rs)	SID	PID	Cost(Rs)
1	1	600	2	1	550
1	1	600	3	1	650
2	1	550	1	1	600
2	1	550	3	1	650
3	1	650	1	1	600
3	1	650	2	1	550

SQL Query:

```
SELECT C.sid
FROM Catalog C
WHERE EXISTS (SELECT C1.sid FROM Catalog C1
WHERE C1.pid = C.pid AND C1.sid <> C.sid)
```

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8) Invalid query

Explanation:

This relational algebra statement doesnot return anything because of the sequence of projection operators. Once the sid is projected, it is the only field in the set. Therefore, projecting on same will not return anything.

9)

The following view on Emp can be updated automatically by updating Emp:

```
CREATE VIEW SeniorEmp (eid, name, age, salary)
AS SELECT E.eid, E.name, E.age, E.salary
FROM Emp E
WHERE E.age > 50
```