DBMS
END-SEM EXAM

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1. → Using Emp name as a clustered index is possible only when every employee will have a unique name. If this is ensured, the tuples will be organized according empname ~~alternat~~ automatically.

→ Using empid as a clustered index is definitely possible considering ~~one~~ every one already has a unique id assigned to them. The tuples will be organized accending to empid.

→ Using both empname & empid as clustered indexs many of be possible, two name one ~~di one~~ clustered index and non-clustered index then it is possible.

2. (a) The DDL is important in representing information in DBMS because it is used to describe external and logical shemas.

(b) The DML is used to access and update data; it is not important for representing the data.

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3. A DBMS is typically shared among many users. Transactions from the users can be interleaved to improve the execution time of user's queries. By interleaving queries, users do not have to wait for other user's transactions to complete fully before their own transaction begins. with out & interleaving, if users A begins a transaction that will take 10 seconds to complete, and user's B would have to wait an addition 10 seconds for user A's transaction to complete before the database would begin processing user B's request.

∴ it is true that DBMS interleave the actions of different transactions instead of executing transactions one after the other.

4. (a) A user must guarantee that his or her transaction does not corrupt data & 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 & her account. A database application would be worthless if a person removed 20 dollars from an ATM but the transaction set their balance to zero.

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(b) A DBMS must guarantee that transactions.
An essential property of a DBMS is that a transaction should execute atomically, or as if it is the only transaction running. Also, transactions will either complete fully, or will ~~either complete fully~~ be abbited and the data base returned to it's intial state.
This ensures that database remains consistent.

5. No, it is not possible to determine a key of a relation given only one instance.

Ex:-

No	name	age	phone no	Email
1	Joshasree	20	9848---41	abc@gmail.com

We know sure that phone no, Email may get unique values But some time same phone no can be shared by 2 students also (same family)
So we dont know what are unique columns.
key must be - unique, not null
These qualities we cannot find using one instance.

→ We can find key during requirement analysis or using functional dependencies of the table.

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6. (i) * Create clustered Index studentName_index on student (studentName ASC)

⇒ it will create Index on student Name where student is table. name.

* Select Email from student.

output :

Email
Jaya@xyz.com
Jh@xyz.com
krishna@pqr.com

(ii) S.Age >=21 is added then Output

Student ID	student Name	Email	Age
1005	krishna	krishna@pqr.com	22
1030	John	Null	23
1020	John	Jh@xyz.com	22

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7. Relation algebra :-

$P(C_1, catalog)$

$P(C_2, catalog)$

$\pi_{C_1.pid}\ \sigma_{C_1.pid = C_2.pid \wedge C_1.sid != C_2.sid}(C_1 \times C_2)$

SQL query :-

Select distinct (C_1.pid) from catalog C_1 cross Join catalog C_2 where $C_1.pid = C_2.pid$ and $C_1.sid != C_2.sid$.

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8. Actually in the given query inner query is Projecting Sid. So it will give only Sid values of Suppliers who supply parts which are 'red color' and 'cost less than 100'

Now in the outer query it is projecting S.name. but we cannot project Sname as we have only Sid values returned in inner query.

So invalid. But if we can rearrange bracket before Suppliers, then the query becomes valid and result as

8. Parts table:-

Pid	Pname	Color
1	xyz	red
2	abc	red
3	lmn	blue

↳ Color = 'red' Parts.

Catalog table:-

Sid	Pid	Cost
101	1	90
101	2	110
102	3	90

↳ cost < 100 catalog

Natural join (⋈)

Pid	Pname	Color	Sid	Pid	Cost
1	xyz	red	101	1	90

Π_{Sid} ;

Sid
101

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Π_{Sname} (101 ⋈ Suppliers)

So the final result will be;

The query finds the names of Suppliers who supply some parts which are red color and cost less than 100.

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.ename, E.age, E.salary from
Emp E
WHERE E.age > 50.
```