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Q2. using empname as a clustered index. when it is unique for all employee, the tuples ~~would~~ would get organized accordingly.

using empid as a clustered index is possible since it can ~~be~~ can be unique for all employees.

Q2. DDL is important in defining structure in DBMS because it is used to describe schema and data types.

(ii) DML is used to access and update data. It is not important for describing structure.

Q3. The ~~statement~~ statement is TRUE, DBMS interleaves the actions of different transaction instead of executing transaction one after other.

If a user X's transaction takes 20 seconds and user Y is ~~is~~ wants to do a transaction without interleaving but she would have to wait for 20 seconds ~~and~~ extra just for their chance to arrive since user X's transaction is still going on.

Q4

(a) The user must ensure that the ~~transactions~~ transactions should always be logical, for example a person ~~can~~ withdrawing ₹100 from a ~~current~~ account having ₹95 balance.

(b) The DBMS should ~~not~~ guarantee atomicity for ~~multiple~~ transaction ~~since~~ since in the case of multiple transactions each and every transaction should either executed fully or aborted if there are any issues. This would also help in consistency of database.

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Q5. Defining key by just one instance of the relation. Since in some other case the key might not suffice, this can happen when the other case has totally different tuples. Hence the defining of key would just be a mere prediction.

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Q7

query in relational Algebra:

$\rho(R_1, \text{catalog})$
 $\rho(R_2, \text{catalog})$

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

- $R_1 \times R_2$ would give ~~all~~ the cross product of both catalogs
- the $R_1.pid = R_2.pid \wedge R_1.sid \neq R_2.sid$ would leave only the ~~unique~~ pids having multiple suppliers
- Π would give only unique values so only the single occurrences of all pids having at least two different suppliers

Query in SQL:

```
SELECT pid FROM R1  
LEFT JOIN R2  
ON R1.pid = R2.pid  
GROUP BY R1.pid;
```


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Q8. $\pi_{sid} (\sigma_{color='Red'} (Parts)) \bowtie (\sigma_{cost < 100} (Catalog)) \bowtie Suppliers$

→ This gives all the parts of Red color having cost < 100

→ $\pi_{s.name} (")$ would give the name of all the suppliers satisfying the above condition.

Q9. Query:

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