1.A

Select cid,cname,email,c.city from customers;

Select cname,email from customers where city=’hyderabad’;

2.A

SELECT customers.customer\_id, customers.customer\_name, orders.order\_id

FROM customers

LEFT JOIN orders ON customers.customer\_id = orders.customer\_id;

3.A

SELECT column1, column2

FROM table1

WHERE condition1

UNION

SELECT column1, column2

FROM table2

WHERE condition2;

4.A

START TRANSACTION;

INSERT INTO orders (customer\_id, order\_date, order\_value)

VALUES (123, '2024-05-23', 100.00);

COMMIT;

UPDATE products

SET stock\_quantity = stock\_quantity - 1

WHERE product\_id = 456;

ROLLBACK;

5.A

START TRANSACTION;

INSERT INTO orders (customer\_id, order\_date, order\_value)

VALUES (123, '2024-05-23', 100.00);

SAVEPOINT sp1;

INSERT INTO orders (customer\_id, order\_date, order\_value)

VALUES (456, '2024-05-24', 200.00);

SAVEPOINT sp2;

INSERT INTO orders (customer\_id, order\_date, order\_value)

VALUES (789, '2024-05-25', 300.00);

ROLLBACK TO SAVEPOINT sp2;

COMMIT;

6.A

Transaction logs are a crucial component of database management systems, serving as a record of all changes made to the database. They play a vital role in ensuring data integrity and facilitating data recovery in the event of system failures or unexpected shutdowns. The log-based recovery mechanism in DBMSs guarantees that no committed transactions are lost in the event of a system crash, ensuring the reliability and consistency of the database.

Scenario: A company's database, which is the backbone of its operations, experiences an unexpected shutdown due to a power outage. The database is configured to use transaction logs, which are regularly backed up. Upon restart, the database administrators realize that some critical data was lost during the shutdown.

Recovery Process:

1. Restore from Backup: The database administrators restore the database from the last available backup.

2. Apply Transaction Logs: They then apply the transaction logs from the backup to the point just before the shutdown. This process, known as "redo," replays all committed transactions from the log file, bringing the database up to the state it was in just before the shutdown[2].

3. Recover Lost Data: By analyzing the transaction log, the administrators can identify the lost data and recover it. This may involve using specialized tools that can read the transaction log and generate scripts to recreate the lost data[3].

4. Verify Data Integrity: Once the data is recovered, the administrators verify its integrity to ensure that it is consistent and accurate.

Conclusion: In this hypothetical scenario, the transaction log proves instrumental in data recovery after an unexpected shutdown. By restoring from a backup and applying the transaction logs, the database administrators are able to recover lost data and ensure the integrity of the database. This highlights the importance of regular backups and the use of transaction logs in maintaining data reliability and consistency.