IAT-2 Question Bank
Module-2

1. Explain different types of update operation on relational database.
2. Explain Integrity Constraint and Explain the importance of Referential Integrity constraint.
3. Explain Unary Relational operations with examples?
4. Explain relation algebra JOIN operation and its types with an example.
5. **Discuss ER to Relational Mapping algorithm for Company database with example for each step.**

6. Consider the two tables T_1 and T_2 shown below:

T_1

P	Q	R
10	a	5
15	b	8
25	a	6

T_2

A	B	C
10	b	6
25	c	3
10	b	5

Show the results of the following operations:

(i) $T_1 \bowtie_{T_1.P=T_2.A} T_2$

(ii) $T_1 \bowtie_{T_1.Q=T_2.B} T_2$

(iii) $T_1 \bowtie_{(T_1.P=T_2.A \text{ AND } T_1.R=T_2.C)} T_2$

7. Consider the following relational database schema and write the queries in relational algebra expressions:

EMP(Eno, Ename, Salary, Address, Phone, DNo)
DEPT(DNo, Dname, DLoc, MgrEno)
DEPENDENT(Eno, Dep_Name, Drelation, Dage)

(i) List all the employees who reside in 'Belagavi'.
(ii) List all the employees who earn salary between 30000 and 40000
(iii) List all the employees who work for the 'Sales' department
(iv) List all the employees who have at least one daughter
(v) List the department names along with the names of the managers

8. Explain informal design guidelines for relational schema design.
9. With a neat diagram explain transition diagram of a transaction.
10. Why concurrency control and recovery are needed in DBMS? Explain 4 types of problems that may occur when two simple transactions run concurrently.
11. Define Schedule? Illustrate with an example.
12. Define Serializability.

Determine if the following schedule is serializable and explain your reasoning: i) T1 : R(X)W(X) T2 : R(X)W(X) T1 : COMMIT T2 : COMMIT ii) T1 : W(X)R(Y) T2 : R(X)W(Y) T1 : COMMIT T2 : COMMIT

MODULE-5

13. Explain the Two-phase locking protocol used for concurrency control.
14. Explain the Concurrency control based on Timestamp ordering
15. Explain the Concurrency control based on Granularity.
16. What is Multiple Granularity locking? How is it implemented using intension locks? Explain.
17. What is NOSQL? Explain the CAP theorem.
18. What are document based NOSQL systems? Explain basic operations CRUD in MongoDB.
19. c) What is NOSQL Graph database? Explain Neo4j.
20. List and explain the four major categories of NOSQL system.