Year 2009

1. **Explain Three schema architecture**
2. **Explain generalisation, specialization and aggregation in ER diagram.**
3. **Consider the following table with their functional dependencies**

**Employee ( Emp\_Id, Emp\_Name, Address, Design, Dept\_Id, Dept\_Name, Course, Duration )**

**Emp\_Id ∅ Emp\_Name, Address, Design, Dept\_Id, Course Dept\_Id ∅ Dept\_Name Course ∅ Duration**

**Normalize the table upto BCNF.**

1. **Explain the Query optimization technique with relevant examples.**
2. **Write down the functions of a DBA.**
3. **Multi-level index**
4. **Aggregation in ER model**
5. **Three level data abstraction**
6. **DBMS architecture**
7. **Atomicity problem.**

Year 2010

1. **What is multi valued dependency ? What type of constraints does it specify ? When does it arise ?**
2. **Define trivial and non trivial MVD. What is de-normalization?**
3. **Consider the following relation :**

**CUSTOMER ( Cust id , name, address, city, state, pin ). The relation is decomposed into the following relations : R1 (Cust id , name, address, pin) and R2 (city, state, pin Examine whether the decomposition leads to DK/NF or not.**

1. **Assuming the following example discuss the requirement of ACID property :**

|  |
| --- |
| **read (A)** |
| **A : = A – 500** |
| **Write (A)** |
| **Read (B)** |
| **B : = B + 500** |
| **Write (B)** |

1. **How does recovery manager implement shadow-database schema for transaction execution ?**
2. **What do you mean by 5th normal form ? Consider the relational schema PRODUCTS (agent , company , product ). The assumption is that an agent must always sell all products manufactured by the company. Determine with valid explanation whether the following table is in 5th normal form or not :**

|  |  |  |
| --- | --- | --- |
| **Agent** | **Company** | **Product** |
| A1 | C1 | P1 |
| A1 | C1 | P2 |
| A1 | C2 | P1 |
| A2 | C1 | P1 |
| A2 | C1 | P2 |

Year 2011

* **Explain the following with respect to a single example :**

1. **Super Key**
2. **Candidate Key**
3. **Primary Key**
4. **Foreign Key**
5. **Alternate Key**

* **What is a view ? "View does not take any memory space". Justify. How do you create an insertable and updatable view ?**
* **Explain the three schema architecture.**
* **Explain the query optimization technique with a suitable example.**
* **Hashing in file organization.**
* **Index-Sequential file organization**
* **Multilevel Index**
* **Three level data abstraction**
* **ACID property**

Year 2012

* **Consider the universal relation**

**R = {A, B, C. D, E, F, G, H, I, J } and the set of Functional Dependencies F={ { A,B } { C }, { A } { D, E },{ B } { F }, { F } { G, H },{ D } { I, J } }**

1. **What is the key for R ?**
2. **Decompose R into 2NF and 3NF relations.**

* **Describe the 3-layer architecture of DBMS.**
* **What is the difference between Procedural DML and Non-procedural DML ?**
* **Write down the functions of a DBA.**
* **What is meant by query optimization ? Explain briefly.**
* **Discuss the differences between the candidate key and the primary key of a relation. Explain what is meant by a foreign key.**
* **What is extraneous attribute ? How to test an extraneous attribute ? Explain with an example.**

Year 2013

* **How does tuple relational calculus differ from domain relational calculus ? Discuss the meaning of the existential quantifier (∃) and the universal quantifier (∀).**
* **“Every BCNF is also in 3NF and more restrictive constraints than 3NF” explain.**
* **Find the minimum cover of F = {A → BC, AC → D, D → B, AB → D}**
* **Consider the relation R = {A,B,C,D,E,F,G,H,I,J) and the set of Functional Dependencies F**
* **{A,B} → C**
* **A → {D,E}**
* **B → F**
* **F → {G,H}**
* **D → {I,J}**

1. **Deduce the key for R**
2. **Normalize R up to 3NF.**

* **Express the algebraic operation of Division in terms of π, × and – operations, where π represents Projection, × represents Cartesian Product and – represents Set Difference.**
* **Query and its optimization**
* **Network Data Model**
* **Enhanced ER Diagram**
* **Applications of normalization**
* **Armstrong’s Axioms**

Year 2014

* **Explain Generalization, Specialization and Aggregation in ER diagram.**
* **What is view? View does not take any memory space, justify. How do you create insertable and updatable view?**
* **What is FD?**

**What is the highest NF of each of the following relations?**

1. **R1(A,B,C)with FDs are A->B, A->C, C->B**
2. **R2(A,B,C,D) with FDs are A->BC, CD->B**

* **Define: Super key, Candidate key, Primary key, Foreign key, Alternate key.**
* **List all relational algebra operations and explain one of them.**
* **Briefly explain different JOIN operation with example.**

Year 2015

* **What is granularity of locking? State Tree protocol**
* **Describe the Thomas write rule in Timestamp ordering?**
* **What do you mean by Temporary update problem? Explain with example.**
* **Explain the Cascading Abort with example**
* **What is trivial MVD**
* **Discuss the advantage of Timestamp Ordering Protocol over 2PL protocol**
* **Discuss the benefits of rigorous 2PL**
* **Discuss the structure of log of transaction table. What is checkpointing? How checkpoint can be used in log?**

Year 2016

* **Is the given schedule S both recoverable and cascade less? Give reason for your answer.**

**S:r1(A),r2(B),w1,(A), r2(A),w2(A), r3(A),w3(A), w1(B)c1,a2**

* **Define trivial MVD and trivial join dependency. “MVD is a special case of JD”. Justify the stmt.**
* **Write the basic steps to create an explicit cursor.**
* **What is lost update problem? What is phantom problem?**
* **Discuss Thomas write rule**
* **MVD**
* **Shadow paging**
* **Wound and wait vs Wait and die scheme**
* **Write ahead log protocol**
* **Transaction states**

Year 2017

* **Prove that**

**[R : qR] SJ F[S:qs] >= [R SJ FS:qs AND qs AND F]**

* **What is Mixed Fragmentation? Explain with an example.**
* **What is the rules to be followed when defining fragments.**
* **What is locking? What is the shared and exclusive locks? Discuss the Timestamp protocol in relation with Distribution Database System.**
* **Explain the significance of the semi-join program in context with DDBMS**
* **Vertical and derived fragmentation**
* **Distributed deadlock**
* **Transparency**
* **Heterogeneous databases**
* **Non-blocking commitment protocols.**

Year 2023

* **What is view? View does not take any memory space, justify. How do you create an Insertable and Updatable view?**
* **What is database? Explain the advantages of DBMS over File oriented system?**
* **Explain various types of Data models in DB systems.**
* **What is the Degree of Relationships?**
* **What is 2NF? Give Example**

Year 2023

* **Briefly explain different JOIN operation with example.**
* **Explain three tier architecture.Difference between two tier and three tier architecture.**
* **Define Optimistic Concurrency Control with example.**
* **Define entity.Explain strong and weak entity**
* **What is primary and secondary indexing.**