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| **#** | **Question** | **Suggested Answer** | **What Interviewers Look For** |
| 1 | What are partial, transitive, and trivial functional dependencies? | Trivial FD: A → B is trivial if B ⊆  A. Partial FD: Non-prime attribute depends on part of candidate key. Transitive FD: A → B and B → C implies A → C. | Understanding of types of FDs and their role in normalization. |
| 2 | What are anomalies in a database? How does normalization help? | Insertion, deletion, update anomalies due to redundancy. Normalization reduces redundancy and avoids anomalies. | Ability to identify anomalies and apply normalization to resolve them. |
| 3 | What is normalization? Why is it important? | Organizing data to reduce redundancy and ensure integrity. Prevents anomalies during database operations. | Conceptual clarity on database structuring. |
| 4 | How would you design a student-course registration system with normalization in mind? | Entities: Student(StudentID, Name, Email), Course(CourseID, CourseName), Registration(StudentID, CourseID, Semester). Normalized to 3NF/BCNF. | Schema design using normalization principles. |
| 5 | Write SQL to identify partial dependencies in a given relation. | Cannot be done via SQL. Must be done logically via schema analysis. | Awareness of limitations of SQL and need for logical reasoning. |
| 6 | What is BCNF? How is it different from 3NF? Give an example. | BCNF: LHS of every FD must be a super key. 3NF allows LHS not to be a super key if RHS is prime.  Example: A → B, B → A, satisfies 3NF, not BCNF. | Understanding of advanced normalization forms. |
| 7 | Given R(A, B, C, D) with FDs A  → B, B → C, A → D. Is A a candidate key? | A⁺ = {A, B, C, D}, so A is a candidate key. | Ability to compute attribute closure to identify candidate keys. |
| 8 | Can a table be in 3NF and not in BCNF? Give example. | Yes. R(A, B, C), FDs: A → B, B →  A. Candidate keys: A, B. 3NF holds, but B → A violates BCNF. | Knowledge of exceptions in normalization forms. |
| 9 | Explain lossless and lossy decomposition. | Lossless: No data loss on join. Lossy: Some info lost on join. R = R1 𝔚 R2 must hold for lossless. | Understanding of decomposition correctness. |
| 10 | What is a transitive dependency, and why is it removed in 3NF? | A → B and B → C implies A → C. Removed in 3NF to avoid redundancy and anomalies. | Understanding of 3NF design goals. |
| 11 | True or False: If a relation has only one candidate key, it must be in BCNF. | ❌ False. Even with one candidate key, a non-superkey FD can violate BCNF. | Understanding that BCNF is not automatically satisfied. |

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| 12 | What is meant by dependency preservation in normalization? | All FDs from original relation must be preserved in decomposed ones. | Awareness of practical normalization concerns. |
| 13 | Normalize: Product(ProductID, ProductName, SupplierName, SupplierPhone, Category) | Remove partial/transitive dependencies. Tables: Product, Supplier. Avoids update/insert/delete anomalies. | Ability to identify FDs and normalize to 3NF. |
| 14 | Normalize: Employee(EmpID, EmpName, Department, Manager, ManagerPhone) | FDs: EmpID → Manager, Manager  → ManagerPhone. Decompose to: Employee, Manager. In 3NF. | Identifying transitive dependencies and decomposing. |
| 15 | Normalize: Enrollments(StudentID, StudentName, CourseID, CourseName, Instructor) | Student, Course, Enrollments as separate tables. Avoids redundancy. In 3NF. | Application of normalization in academic systems. |
| 16 | Should TotalSalary = BaseSalary  + Bonus be stored? Why or why not? | No. It's derived data, leads to anomalies. Calculate in queries. | Understanding of derived data and 1NF principles. |
| 17 | Normalize: Cart(CartID, ProductID, ProductName, Price, Quantity, TotalPrice) | Remove derived TotalPrice. Use: Cart(CartID, ProductID, Quantity), Product(ProductID, ProductName, Price). | Avoiding redundancy and enforcing computation at query time. |
| 18 | Can a relation be in BCNF and still have anomalies? | ✅ Yes. BCNF doesn't handle multivalued dependencies. 4NF needed to address them. | Knowledge of BCNF limitations and 4NF role. |
| 19 | Is every relation in 3NF automatically in BCNF? | ❌ No. 3NF allows non-superkey FDs if RHS is prime. BCNF doesn't. | Differentiation between 3NF and BCNF. |
| 20 | What happens if a transitive dependency exists on a candidate key? Is it a 3NF violation? | ❌ No. If RHS is prime, 3NF allows it. Not BCNF though. | Nuanced understanding of 3NF conditions. |
| 21 | Table is in 1NF and has no partial dependency, but still not in 3NF. Why? | May have transitive dependency (e.g., EmpID → DeptID → DeptName). | Awareness of 3NF violation scenarios. |
| 22 | Can a table with no candidate key still be in 1NF? | ✅ Yes. 1NF only requires atomic values, no repeating groups. | Understanding of 1NF's basic requirements. |
| 23 | If a relation has only one candidate key, can it still violate BCNF? | ✅ Yes. If FD has a non-superkey determinant. | Deep understanding of BCNF rule. |
| 24 | Is a relation with only trivial dependencies always in BCNF? | ✅ Yes. All LHS are superkeys by definition. | Mastery of trivial dependency concepts. |

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| 25 | If a relation has only one attribute, is it always in 1NF, 2NF, 3NF, BCNF, 4NF, 5NF? | ✅ Yes. No FDs or anomalies to violate any normal form. | Conceptual understanding of normalization basis. |
| 26 | Which normal form ensures the elimination of all anomalies? | 5NF. BCNF removes FD anomalies, 4NF handles MVDs, 5NF removes join anomalies. | Understanding the hierarchy of normalization forms. |
| 27 | True or False: A relation can be in 2NF and BCNF at the same time. | ✅ True. If every FD’s LHS is a superkey, and no partial dependencies exist. | Recognizing valid overlapping normal forms. |
| 28 | Can a relation with a single FD violate BCNF? | ✅ Yes, if LHS is not a superkey. Example: FD: B → C, Candidate Key: A. | Recognition of BCNF conditions with simple examples. |
| 29 | Customer order table has customer address & order details. Anomalies? Fix? | Update, Insert anomalies. Decompose into Customer and Order tables. | Skill in spotting real-world anomalies and restructuring schema. |
| 30 | Employee and department info in one table. Department name not updated across rows. What’s the anomaly? Fix? | Update anomaly. Split into Employee and Department tables. | Identifying redundancy and update anomaly. |