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| **QUESTION BANK** | | | |
| **GURU NANAK INSTITUTE OF TECHNOLOGY** | | | |
| **An Autonomous Institute under MAKAUT** | | | |
| **2024** | | | |
| **DATABASE MANAGEMENT SYSTEM** | | | |
| **EC605A** | | | |
| **QUESTION NO** | **Short Answer Type Questions** | |
| **Q.1** | Differentiate between weak entity and strong entity. |  | |
| **Q.2** | What is data independence? |
| **Q.3** | Explain various types of data model. |
| **Q.4** | What is Multivalued Dependency? |
| **Q.5** | Explain Insertion, Deletion, Modification anomalies. |
| **Q.6** | Explain generalization, specialization and aggregation. |
| **Q.7** | Explain the following terms: a) Functional dependency b) Prime and Non-prime attribute. |
| **Q.8** | Draw an E-R diagram of Railway Reservation system. |
| **Q.9** | What is difference between DELETE & TRUNCATE commands? |
| **Q.10** | Describe recursive relationship with example. |
| **Q.11** | Explain cardinality ratio with example. |
| **Q.12** | Define BCNF. Why it is stronger than 3NF. |
| **Q.13** | Explain about Loss less-join dependency? |
| **Q.14** | Define Instances and schemas of database? |
| **Q.15** | Define Armstrong axioms for FD’s? |
| **Q.16** | What is locking? |
| **Q.17** | What is two phase locking protocol? |
| **Q.18** | Illustrate the properties of transaction. |
| **Q.19** | Explain deletion and search operation in B+ trees? |
| **Q.20** | Explain about Loss less-join dependency? |
| **Q.21** | Explain trivial and Non trivial functional dependency with example. |
| **Q.22** | What is the difference between a shared lock and exclusive lock? |  | |
| **Q.23** | What are the unary operations in Relational Algebra? |  | |
| **Q.24** | Define the term data redundancy and data consistency. |  | |
| **Q.25** | With an example show how a referential integrity can be implemented. |  | |

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| **QUESTION NO** | **Long Answer Type Questions** |  |
| **Q.1** | Explain generalization, specialization and aggregation. |  |
| **Q.2** | Describe different states of transaction. |  |
| **Q.3** | What is trivial and transitive functional dependency (FD)? |  |
| **Q.4** | Illustrate 3NF and BCNF. |  |
| **Q.5** | Describe different states of transaction. |  |
| **Q.6** | Consider the relational database as given below and write down expressions in relational algebra for the following queries.  Data\_Master(data\_id, item name, reorder level)  Data\_Details (data\_id, Supplier\_id, Purchase\_date, Qty, Utcost)  i) Select supplier id where purchase date is 4th December, 2022)  ii) Select the minimum quantity sold.  iii) Select name of the item where supplier id is ‘S00001’ |  |
| **Q.7** | Consider the following two schedules. Check whether both of these schedules are conflict-serializable or not. Explain.  S1: R1(X) R1(Y) R2(X) R2(Y) W2(Y) W1(X)  S2: R1(X) R2(X) R2(Y) W2(Y) R1(Y) W1(X) |  |
| **Q.8** | Given a set of FDs for the relation schema R (A,B,C,D,E). The FDs are {BC―>D, AC―>BE, B―>E}. Explain and find out the highest normal form of R. |  |
| **Q.9** | Design a database for a college. Many students seek admission in the college. The college has a number of departments and students can be enrolled to these departments. The department also offers a number of courses to the students, each with a different duration from the other. Each department has its H.O.D and many teachers under him. The syllabus of each course is also defined. Teachers are recruited by the college for teaching the said courses to the students. The teachers may have different qualifications and experience. They may also teach different subjects if required. Each student in the college has a unique ID. We need to store the names of the students studying in the college, their residential address, date of birth. We also need to store information about the college like the name, address, contact number, reference ID, departments of the college, name of the H.O.D, number of teachers and students in the department. Also, the courses offered by the departments, the syllabus, the duration and the course ID. We can also store information about the teachers like their qualification, experience, name and subjects taught.  Draw ER Diagram for this case study. |  |
| **Q.10** | Explain three level architecture of DBMS. |  |
| **Q.11** | Create a B+ tree ( of order-3) with the following keys 8, 5 , 1, 7, 3, 12, 9, 6 And now delete 12, 5 |  |
| **Q.12** | Explain the difference between Primary index & secondary index. |  |
| **Q.13** | What is Blocking factor? What is block anchor? |  |
| **Q.14** | With proper example explain how recovery in a database system can be done using LOG files when the following techniques are used  i) Immediate update technique ii) Deferred update technique |  |
| **Q.15** | Explain Entity Relationship Model. What do you mean by serializability of transactions? |  |
| **Q.16** | Short note : (a) Data Models (b) Foreign key (c) Aggregate functions (d) Ordered indexing and hashing (e) Wait/Die and Wound/Wait deadlock protocols (f) Database languages (g) Armstrong’ axioms for FD’s.(h) Inner Join and Outer Join  (i) DBA(j) SQL joins(k) Keys in DBMS (l) Users in DBMS |  |
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| **Q.17** | Explain about Selection, Projection, Rename, division and Cartesian product operations in relational algebra? 7. Discuss about Domain Relational Calculus? Write and explain a query in DRC to Find the names of sailors who have reserved boat 103. |  |
| **Q.18** | Determine the closer of the following set of functional dependencies for a relational scheme R(A,B,C,D) and FDs {AB → C, C → D, D → A}. List out the candidate keys of R.  Determine the closer of the following set of functional dependencies for a relational scheme R(A,B,C,D) and FDs {AB → C, C → D, D → A}. List out the candidate keys of R. |  |
| **Q.19** | Explain about Aggregate operators in sql with examples? 2. Discuss correlated nested queries? Explain about Selection, Projection, Rename, division and Cartesian product operations in relational algebra? |  |
| **Q.20** | [What is a Phantom deadlock?](https://afteracademy.com/blog/what-is-a-phantom-deadlock/) What is a checkpoint and when does it occur?  Differentiate between Clustered and non-Clustered indexes. |  |