DBMS (Database Management Systems) Question Bank

UNIT-I

1.a) What is DBMS? Explain the advantages of DBMS ?

   b)Explain the integrity constraints?

2. a)Discuss various types of commands in SQL with syntax and examples?

   b) b)What is data model? Explain the relational model.

3.a)Explain the database system structure with a neat diagram?

   b) Explain the three levels of data abstraction?

4. (a) Construct an ER diagram for a bank Database. Bank maintains data about customers, their loans, their deposits, lockers. Determine the entities and relationships.

   (b) Define the terms: Entity Set, Role, Relationship set, Aggregation.

UNIT II

1.a)For the following relational database write the expressions in sql.

   Branch_schema(branch_name,branchcity,Asserts)

   Customer_schema(customername,customerstreet,customercity)

   Loan_schema(Branchname,loan_number,Amount)

   Borrower_schema(customername,laon_number)

   Account_schema(Branchname,Account_number,balance)

   Depositor_schema(customername,account_number)

   i)Find the names of all branches in loan_schema?

   ii)Find set of all customers who have an account at the bank?

   iii) Find all customers having loan, account or both at bank?

   iv) Display customer names in alphabetical order who have a loan at abides branch?

2.a)Define a concept of aggregation and generalization?

   b)Write about different types of attributes? Explain the types of integrity constraints?

3.Write the sql expressions for the following relational database?

   Sailor_schema(sailor_id,Boat_id,sailorname,rating,age);

   Reserves_schema(sailor_id,Boat_id,day);

   Boat_schema(boat_id,boatname,color);

i) Find the average age of sailor for each rating level that at least 2 sailors.

ii)Find all the names who have reserved the red boat?

iii)Find the names who has reserved both red and blue boat

iv)Find the names who has reserved red or blue boat

v)Find the names of sailors name starts with 'S' or ends with 'S'

4. (a) Explain covering constraints & overlap constraints.

(b)Explain about set operations and joins in Relational Algebra with examples.

UNIT –III

1. What is dependency preservation property for decomposition? Explain why it is important.

2. Explain the 4NF.why is it useful? Explain with example.

3. (a)Define BCNF. How does BCNF differ from 3NF? Explain with example.

(b)Explain 3NF? Give one example?

4. (a) What is Normalization? Give types of normalization

(b) What are the advantages of normalized relations over the unnormalized relations?

5. (a) Explain functional dependencies and multivalued dependencies with examples.

(b) Consider the relation R (A, B, C, D, E, F) and FD's

A->BC

F->A

C->A

D->E

E->D

Is the decomposition of R into R1 (A, C, D), R2 (B, C, D) & R3 (E, F, D) lossless? Explain the requirement of lossless decomposition.

6. (a) Let R= (A, B,C,D,E) and let M be the following set of multivalued dependencies

A->>BC,

B->>CD,

E->>AD

List the nontrivial dependencies in M+.

(b) Describe the properties of normalized and un normalized relations.

7. What is normalization? Discuss the 1NF, 2NF and 3NF Normal forms with examples?

UNIT-IV

1. (a) Define the concepts of a transaction.

   (b) Write short notes on

         i. Serializability   ii. Recoverability

2. (a) With an example explain serial &non serial serializability schedule.

   (b) Describe each of the following locking protocols

         i. Two phase lock   ii. Conservative two phase lock

3. (a) Define the concept of schedule for a set of concurrent transaction with example.

   (b) Explain read –only, write-only &read-before-write protocols in serializability.

4. (a) What are the recovery-related steps involved during normal execution.

   (b)   How does the two phase locking protocol ensures serializability.

5. (a) Define the concept of a schedule for a set of concurrent transactions. Give an example.

   (b) Explain how granularity of locking affects the performance of concurrency control algorithm.

6. (a) What information does the dirty page table and transaction table contain?

   (b) Give a short note on recovery from deadlock.

7. (a) Explain timestamp ordering with an algorithm.

   (b) Explain different locking techniques for concurrency control.

UNIT-V

1. (a) What are the merits & demerits of using fuzzy dumps for media recovery?

  (b) Explain the phases of ARIES algorithm.

  (c) Explain 3 main properties of ARIES algorithm

2. Explain in detail the ARIES recovery method.

3. (a) When a system recovers from a crash ? In what order must transaction be Undone and Redone? Why is this order   important?

  (b) What is log in the content of DBMS? How does check pointing eliminate Some of the problems associated with log based recovery?

4. Describe the shadow paging recovery technique. Under what circumstances does it not require a log.

5. Explain WAL protocol, UNDO algorithm, check pointing and Media Recovery?