Database Engineering Question Bank

1. Define Database. List and explain the applications of Database
2. Explain the ER Model in details with an example
3. List and explain the types of Join in SQL.
4. Explain the rules for reduction of following notation in ERD, with appropriate examples
   a. Weak Entity set
   b. Multivalued attribute in Strong Entity set
   c. Many to One relationship set.
5. List and explain the variants of Two Phase Lock Protocol
6. State and explain various classes of failure in database system
7. List and explain the Extended Features of ER model
8. List and explain aggregate functions of SQL with appropriate examples
9. Define the terms Primary Index and Secondary Index. Differentiate between them on basis of the Evaluation Criteria for indices
10. Explain the purpose of Checkpoint mechanism. Explain the steps for performing a checkpoint.
11. When does a collision occur in hashing? Illustrate various collision resolution techniques
12. Explain with appropriate example the following terms
13. Recoverable Schedules
14. Cascadeless Schedules

a. Define and Differentiate between Super Key, Candidate Key and Primary Key. Giveappropriate example
b. Define Database. List and explain the applications of Database
c. Explain the rules for reduction of following notation in ERD, with appropriateexamples
   i. Weak Entity set
   ii. Multivalued attribute in Strong Entity set
   iii. Many to One relationship set.

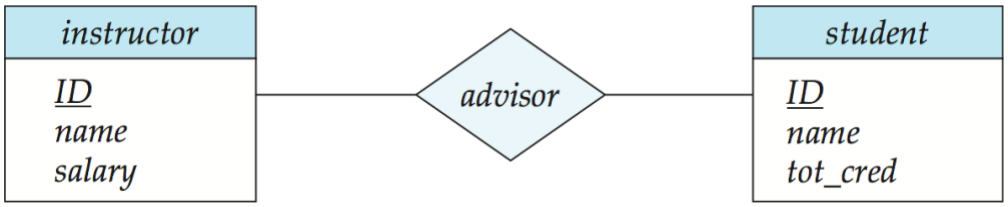
1. List and explain the Extended Features of ER model.
2. List and explain the types of Join in SQL.

3. Explain the following SQL constructs with examples: (1) order by, (2) group by, (3)having, (4) as, (5) in

15. Illustrate Multiple Key Access with appropriate example.
16. Define the terms Primary Index and Secondary Index. Differentiate between them onbasis of the Evaluation Criteria for indices
17. Draw and explain the Transaction State Diagram

18. List and explain the variants of Two Phase Lock Protocol
19. Explain the purpose of Checkpoint mechanism. Explain the steps for performing a checkpoint.
20. Elaborate the Immediate Database Modification with its Recovery mechanism.

21. List different types of users in Database environment. Explain the role played by each of the listed users.
22. Explain the ER Model in details with an example
    Definition 1, symbols 3, example 3marks
23. How ER diagram is reduced. Reduce the below ERD to relational schema.
    a. Reduction 3 marks, example 4 marks



    b. What is data redundancy? Explain the update anomalies.
    c. Definition 1 marks, anomalies 6 marks
    d. Consider the following Database
       design Customer (cid, custname,
       coststreet, custcity)Account (accno,
       branchname,
       i. balance)

       ii. Loan (loanno,
       branchname,
       amount)Borrower
       (cid, loanno)

       iii. Branch (branchname,
       branchcity, asset)
       Depositor (cid, accno)

e. Solve the following queries in SQL

i. Display the name of customers who have both account and loan at the bank.
ii. Update amount of loan to 10000 where loan number is “L-101”.
iii. Change the column name custcity to ccity.
iv. Find all customers who an account but no loan at bank.
v. Ans:-2,2,1,2 marks

f. List and explain aggregate functions of SQL with appropriate examples

24. When does a collision occur in hashing? Illustrate various collision resolution techniques
25. Explain with appropriate example the following terms
    a. Recoverable Schedules
    b. Cascadeless Schedules
26. Explain the time stamp based protocol. Give an example of it. 4 marks, 3 marks.
27. Compare Deferred Database Modification and Immediate Database Modification
28. State and explain various classes of failure in database system

MCQ

1. Which of the following is a attribute or set of attributes which is primary means of uniquely identifying a entity in a relation.

A. Super Key
B. Candidate Key
C. Primary Key
D. Foreign Key

2. Identify the statement among the following that is FALSE:

A. The relation in which all keys have only a single attribute is in its 2NF
B. A relation that has two attributes is in its BCNF
C. The prime attribute can depend transitively on any key in the case of a relation that is in its BCNF
D. The prime attribute can depend transitively on any key in the case of a relation that is in its 3 NF

3. Which functional dependency types is/are not present in the following dependencies? Empno

-> EName, Salary, Deptno, DName

DeptNo -> DName EmpNo -

> DName

A. Full functional dependency
B. Partial functional dependency
C. Transitive functional dependency
D. Both B and C

Given the relations R1 (A, B, C) with 10 tuples and R2 (X, Y, Z) with 5 tuples, how many tuples will be produced by following SQL Query?

Select * from R1 natural join R2

E. 0
F. 5
G. 10
H. 50

4. In ordered indices the file containing the records is sequentially ordered, a is an index whose search key also definesthe sequential order of the file.

A. Clustered index
B. Structured index
C. Unstructured index
D. Nonclustered index

5. In multiple granularity of locks SIX lock is compatible with

A. IX
B. IS
C. S
D. SIX

6. In database recovery, the process of applying committed transactions to the database after a crash is known as:

A. Redo
B. Undo
C. Recovery
D. Rollback

1. The DBMS acts as an interface between what two components of an enterprise-class

database system?

A. Database application and the database
B. Data and the database
C. The user and the database application
D. Database application and SQL

2. In which form of function there is no partial functional dependencies.

A.BCNF

B.**2NF**

C.3NF

D.4NF

1. Select emp_name from department where dept_name like ' Science';

Which one of the following has to be added into the blank to select the dept_name which has Science as its ending string ?

A. %
B. _
C. &
D. !

11 The file organization which allows us to read records that would satisfy the join condition by using one block read is

A. Heap file organization
B. Sequential file organization
C. Clustering file organization
D. Hash file organization

10 Which of the following ensures the atomicity of the transaction?

A. Transaction management component of DBMS
B. Application Programmer
C. Concurrency control component of DBMS
D. Recovery management component of DBMS

12 Before a block of data in main memory can be output to the database, all log records pertaining to data in that block must have been output to stable storage. This is

A. Read-write logging
B. Read-ahead logging

C. **Write-ahead logging**
D. None of the mentioned

15. DDL stands for what
A. Database Definition Level
B. **Data Definition Language**
C. Data Device Latency
D. None of the above

1. A schema is

A . Record Relationship

B. Data Elements

C. Record and files

D . All of the above

2. The DBMS acts as an interface between what two components of an enterprise-class database system?

A. Database application and the database
B. Data and the database
C. The user and the database application
D. Database application and SQL
E.

1. In the ____ normal form, a composite attribute is converted to individual attributes.
A. 1NF
B. 2NF
C. 3NF
D. BCNF

1. All aggregate functions except ignore null values in their input collection.
A. Count(attribut e)
B. Count(*)
C. Avg()
D. Sum()

1. A data dictionary is created when a created.
A. Instance
B. Segment
C. Database

D. Dictionary

1. A transaction is in ..... state after the final statement has been executed

A. active
B. partially committed
C. committed
D. none of the above

1. Which of the following recovery techniques uses a copy of the entire database to provide a consistent snapshot for recovery?

A. Deferred Update
B. Immediate Update
C. Shadow Paging
D. Checkpointing