



KTU NOTES

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**KTU STUDY MATERIALS | SYLLABUS | LIVE
NOTIFICATIONS | SOLVED QUESTION PAPERS**

Questions & Answers- DBMS

1) Define Database.

A prearranged collection of figures known as data is called database.

2) What is DBMS?

Database Management Systems (DBMS) are applications designed especially which enable user interaction with other applications.

3) What are the various kinds of interactions catered by DBMS?

The various kind of interactions catered by DBMS are:

- Data definition
- Update
- Retrieval
- Administration

4) Segregate database technology's development.

The development of database technology is divided into:

- Structure or data model
- Navigational model
- SQL/ relational model

5) Who proposed the relational model?

Edgar F. Codd proposed the relational model in 1970.

6) What are the features of Database language?

A database language may also incorporate features like:

DBMS-specific Configuration and management of storage engine

Computations to modification of query results by computations, like summing, counting, averaging, grouping, sorting and cross-referencing

Constraint enforcement Application

Programming Interface

7) What do database languages do?

As special-purpose languages, they have:

- Data definition language
- Data manipulation language
- Query language

8) Define database model.

A data model determining fundamentally how data can be stored, manipulated and organised and the structure of the database logically is called database model.

9) What is SQL?

Structured Query Language (SQL) being ANSI standard language updates database and commands for accessing.

10) Enlist the various relationships of database.

The various relationships of database are:

- One-to-one: Single table having drawn relationship with another table having similar kind of columns.
- One-to-many: Two tables having primary and foreign key relation.
- Many-to-many: Junction table having many tables related to many tables.

11) Define Normalization.

Organized data void of inconsistent dependency and redundancy within a database is called normalization.

12) Enlist the advantages of normalizing database.

Advantages of normalizing database are:

- No duplicate entries
- Saves storage space
- Boasts the query performances.

13) Define Denormalization.

Boosting up database performance, adding of redundant data which in turn helps rid of complex data is called denormalization.

14) Define DDL and DML.

Managing properties and attributes of database is called Data Definition Language(DDL).

Manipulating data in a database such as inserting, updating, deleting is defined as Data Manipulation Language. (DML)

15) Enlist some commands of DDL.

They are:

CREATE:

Create is used in the CREATE TABLE statement. Syntax is:

```
CREATE TABLE [column name] ( [column definitions] ) [ table parameters]
```

ALTER:

It helps in modification of an existing object of database. Its syntax is:

ALTER objecttype objectname parameters.

DROP:

It destroys an existing database, index, table or view. Its syntax is:

DROP objecttype objectname.

16) Define Union All operator and Union.

Full recordings of two tables is Union All operator.

A distinct recording of two tables is Union.

17) Define cursor.

A database object which helps in manipulating data row by row representing a result set is called cursor.

18) Enlist the cursor types.

They are:

- Dynamic: it reflects changes while scrolling.
- Static: doesn't reflect changes while scrolling and works on recording of snapshot.
- Keyset: data modification without reflection of new data is seen.

19) Enlist the types of cursor.

They types of cursor are:

- Implicit cursor: Declared automatically as soon as the execution of SQL takes place without the awareness of the user.
- Explicit cursor: Defined by PL/ SQL which handles query in more than one row.

20) Define sub-query.

A query contained by a query is called Sub-query.

21) Why is group-clause used?

Group-clause uses aggregate values to be derived by collecting similar data.

22) Compare Non-clustered and clustered index

Both having B-tree structure, non-clustered index has data pointers enabling one table many non-clustered indexes while clustered index is distinct for every table.

23) Define Aggregate functions.

Functions which operate against a collection of values and returning single value is called aggregate functions

24) Define Scalar functions.

Scalar function is depended on the argument given and returns sole value.

25) What restrictions can you apply when you are creating views?

Restrictions that are applied are:

- Only the current database can have views.
- You are not liable to change any computed value in any particular view.
- Integrity constants decide the functionality of INSERT and DELETE.
- Full-text index definitions cannot be applied.
- Temporary views cannot be created.
- Temporary tables cannot contain views.
- No association with DEFAULT definitions.
- Triggers such as INSTEAD OF is associated with views.

26) Define “correlated subqueries”.

A ‘correlated subquery’ is a sort of sub query but correlated subquery is reliant on another query for a value that is returned. In case of execution, the sub query is executed first and then the correlated query.

27) Define Data Warehousing.

Storage and access of data from the central location in order to take some strategic decision is called Data Warehousing. Enterprise management is used for managing the information whose framework is known as Data Warehousing.

28) Define Join and enlist its types.

Joins help in explaining the relation between different tables. They also enable you to select data with relation to data in another table.

The various types are:

- INNER JOINS: Blank rows are left in the middle while more than equal to two tables are joined.
- OUTER JOINS: Divided into Left Outer Join and Right Outer Join. Blank rows are left at the specified side by joining tables in other side.

Other joins are CROSS JOINS, NATURAL JOINS, EQUI JOIN and NON-EQUI JOIN.

29) What do you mean by Index hunting?

Indexes help in improving the speed as well as the query performance of database. The procedure of boosting the collection of indexes is named as Index hunting.

Questions & Answers- MySQL

1. What is MySQL?

MySQL is an open source DBMS which is built, supported and distributed by MySQL AB (now acquired by Oracle)

2. What are the technical features of MySQL?

MySQL database software is a client or server system which includes

- Multithreaded SQL server supporting various client programs and libraries
- Different backend
- Wide range of application programming interfaces and
- Administrative tools.

3. Why MySQL is used?

MySQL database server is reliable, fast and very easy to use. This software can be downloaded as freeware and can be downloaded from the internet.

4. What are Heap tables?

HEAP tables are present in memory and they are used for high speed storage on temporary basis.

- BLOB or TEXT fields are not allowed
- Only comparison operators can be used =, <, >, = >, =<
- AUTO_INCREMENT is not supported by HEAP tables
- Indexes should be NOT NULL

5. What is the default port for MySQL Server?

The default port for MySQL server is 3306.

6. What are the advantages of MySQL when compared with Oracle?

- MySQL is open source software which is available at any time and has no cost involved.
- MySQL is portable
- GUI with command prompt.
- Administration is supported using MySQL Query Browser

7. Difference between CHAR and VARCHAR?

Following are the differences between CHAR and VARCHAR:

- CHAR and VARCHAR types differ in storage and retrieval
- CHAR column length is fixed to the length that is declared while creating table. The length value ranges from 1 and 255
- When CHAR values are stored then they are right padded using spaces to specific length. Trailing spaces are removed when CHAR values are retrieved.

8. Give string types available for column?

The string types are:

- SET
- BLOB
- ENUM
- CHAR
- TEXT
- VARCHAR

9. How to get current MySQL version

```
SELECT VERSION ();
```

10. What are the drivers in MySQL?

- PHP Driver
- JDBC Driver
- ODBC Driver
- C WRAPPER
- PYTHON Driver
- PERL Driver
- RUBY Driver
- CAP11PHP Driver
- Ado.net5.mxj

11. What does a TIMESTAMP do on UPDATE CURRENT_TIMESTAMP data type?

TIMESTAMP column is updated with Zero when the table is created. UPDATE CURRENT_TIMESTAMP modifier updates the timestamp field to current time whenever there is a change in other fields of the table.

12. What is the difference between primary key and candidate key?

Every row of a table is identified uniquely by primary key. There is only one primary key for a table.

Primary Key is also a candidate key. By common convention, candidate key can be designated as primary and which can be used for any foreign key references.

13. What, if a table has one column defined as TIMESTAMP?

Timestamp field gets the current timestamp whenever the row gets altered.

14. What happens when the column is set to AUTO INCREMENT and if you reach maximum value in the table?

It stops incrementing. Any further inserts are going to produce an error, since the key has been used already.

15. How can we find out which auto increment was assigned on Last insert?

LAST_INSERT_ID will return the last value assigned by Auto_increment and it is not required to specify the table name.

16. How can you see all indexes defined for a table?

Indexes are defined for the table by:

SHOW INDEX FROM <tablename>;

17. What do you mean by % and _ in the LIKE statement?

% corresponds to 0 or more characters, _ is exactly one character in the LIKE statement.

18. What is the difference between NOW() and CURRENT_DATE()?

NOW() command is used to show current year, month, date with hours, minutes and seconds while CURRENT_DATE() shows the current year with month and date only.

19. What is a trigger in MySQL?

A trigger is a set of codes that executes in response to some events.

20. How many Triggers are possible in MySQL?

There are six Triggers allowed to use in MySQL database.

1. Before Insert
2. After Insert
3. Before Update
4. After Update
5. Before Delete
6. After Delete

21. What is the difference between TRUNCATE and DELETE in MySQL?

The DELETE command is used to delete data from a table. It only deletes the rows of data from the table while, truncate is very dangerous command and should be used carefully because it deletes every row permanently from a table.

Questions & Answers- NoSQL

1. Compare NoSQL & RDBMS

Criteria	NoSQL	RDBMS
Data format	Does not follow any order	Organized and structured
Scalability	Very Good	Average
Querying	Limited as no Join Clause	Using SQL
Storage mechanism	Key-Value Pair, document, column storage, etc.	Data & relationship stored in different tables

2. What is NoSQL?

NoSQL encompasses a wide variety of different database technologies that were developed in response to a rise in the volume of data stored about users, objects and products. The frequency in which this data is accessed, and performance and processing needs. Relational databases, on the other hand, were not designed to cope with the scale and agility challenges that face modern applications, nor were they built to take advantage of the cheap storage and processing power available today.

3. What are the features of NoSQL?

When compared to relational databases, NoSQL databases are more scalable and provide superior performance, and their data model addresses several issues that the relational model is not designed to address:

- Large volumes of structured, semi-structured, and unstructured data
- Agile sprints, quick iteration, and frequent code pushes
- Object-oriented programming that is easy to use and flexible
- Efficient, scale-out architecture instead of expensive, monolithic architecture

Questions & Answers- MongoDB

1) Explain what is MongoDB?

Mongo-DB is a document database which provides high performance, high availability and easy scalability.

2) What is “Namespace” in MongoDB?

MongoDB stores BSON (Binary Interchange and Structure Object Notation) objects in the collection. The concatenation of the collection name and database name is called a namespace.

3) What is sharding in MongoDB?

The procedure of storing data records across multiple machines is referred as Sharding. It is a MongoDB approach to meet the demands of data growth. It is the horizontal partition of data in a database or search engine. Each partition is referred as shard or database shard.

4) How can you see the connection used by Mongos?

To see the connection used by Mongos use `db.adminCommand ("connPoolStats")`;

5) Explain what is a replica set?

A replica set is a group of mongo instances that host the same data set. In replica set, one node is primary, and another is secondary. From primary to the secondary node all data replicates.

6) How replication works in MongoDB?

Across multiple servers, the process of synchronizing data is known as replication. It provides redundancy and increase data availability with multiple copies of data on different database server. Replication helps in protecting the database from the loss of a single server.

7) While creating Schema in MongoDB what are the points need to be taken in consideration?

Points need to be taken in consideration are

- Design your schema according to user requirements
- Combine objects into one document if you use them together. Otherwise, separate them
- Do joins while write, and not when it is on read
- For most frequent use cases optimize your schema
- Do complex aggregation in the schema

8) What is the syntax to create a collection and to drop a collection in MongoDB?

- Syntax to create collection in MongoDB is `db.createCollection(name,options)`
- Syntax to drop collection in MongoDB is `db.collection.drop()`

9) Explain what is the role of profiler in MongoDB?

MongoDB database profiler shows performance characteristics of each operation against the database. You can find queries using the profiler that are slower than they should be.

10) Explain can you move old files in the moveChunk directory?

Yes, it is possible to move old files in the moveChunk directory, during normal shard balancing operations these files are made as backups and can be deleted once the operations are done.

11) To do safe backups what is the feature in MongoDB that you can use?

Journaling is the feature in MongoDB that you can use to do safe backups.

12) Mention what is ObjectId composed of?

ObjectId is composed of

- Timestamp
- Client machine ID
- Client process ID
- 3 byte incremented counter

13) Mention what is the command syntax for inserting a document?

For inserting a document command syntax is `database.collection.insert (document)`.

14) Mention how you can inspect the source code of a function?

To inspect a source code of a function, without any parentheses, the function must be invoked.

15) What is the command syntax that tells you whether you are on the master server or not? And how many master does MongoDB allow?

Command syntax `Db.isMaster()` will tell you whether you are on the master server or not. MongoDB allows only one master server, while couchDB allows multiple masters.

16) Mention the command syntax that is used to view Mongo is using the link?

The command syntax that is used to view mongo is using the link is `db._adminCommand("connPoolStats.")`

17) Explain what are indexes in MongoDB?

Indexes are special structures in MongoDB, which stores a small portion of the data set in an easy to traverse form. Ordered by the value of the field specified in the index, the index stores the value of a specific field or set of fields.

18) Mention what is the basic syntax to use index in MongoDB?

The basic syntax to use in MongoDB is `>db.COLLECTION_NAME.ensureIndex ({KEY:1})`. In here the key is the the name of the COLUMN (or KEY:VALUE pair) which is present in the documents.

19) Explain what is GridFS in MongoDB?

For storing and retrieving large files such as images, video files and audio files GridFS is used. By default, it uses two files `fs.files` and `fs.chunks` to store the file's metadata and the chunks.

20) What are alternatives to MongoDB?

Cassandra, CouchDB, Redis, Riak, [Hbase](#) are a few good alternatives.