

Review Questions for Final – CS520

http://www.tutorialspoint.com/dbms/dbms_quick_guide.htm

1. ACID stands for Atomicity, Consistency, Isolation, Durability. It is a set of properties that guarantee that database transactions are processed reliably

- a. True
- b. False

In computer science, ACID (Atomicity, Consistency, Isolation, Durability) is a set of properties that guarantee that database transactions are processed reliably. In the context of databases, a single logical operation on the data is called a transaction. For example, a transfer of funds from one bank account to another, even involving multiple changes such as debiting one account and crediting another, is a single transaction.

2. In the context of databases, a single logical operation on the data is called a transaction. For example, a transfer of funds from one bank account to another, even involving multiple changes such as debiting one account and crediting another, is a single transaction.

- a. True
- b. False

3. Atomicity means

- a. **the smallest unit of operation of database operations**
- b. everything in a transaction succeeds or the entire transaction is rolled back.
- c. database operations are atomic, not molecular
- d. All of the above
- e. None of the above

*In database systems, **atomicity** (or **atomicness**; from Greek a-tomos, undividable) is one of the **ACID transaction** properties. In an **atomic transaction**, a series of database operations either all occur, or nothing occurs. The series of operations cannot be divided apart and executed partially from each other, which makes the series of operations "indivisible", hence the name. A guarantee of atomicity prevents updates to the database occurring only partially, which can cause greater problems than rejecting the whole series outright. In other words, atomicity means indivisibility and irreducibility.^[1] As a consequence, the transaction cannot be observed to be in progress by another database client. At one moment in time, it has not yet happened, and at the next it has already occurred in whole (or nothing happened if the transaction was cancelled in progress).*

4. Consistency means

- a. **any transaction will bring the database from one valid state to another. A transaction cannot leave the database in an inconsistent state**
- b. data is consistently backed up

- c. tables' columns have to be consistent
- d. All of the above
- e. None of the above

Consistency in **database** systems refers to the requirement that any given **database** transaction must change affected data only in allowed ways. Any data written to the **database** must be valid according to all defined rules, including constraints, cascades, triggers, and any combination thereof.

5. Isolation means transactions cannot interfere with each other.

- a. **True**
- b. False

6. The **durability** property ensures that

- a. **once a transaction has been committed, it will remain so, even in the event of power loss, crashes, or errors.**
- b. database is durable, never fails
- c. database can last for a long time
- d. All of the above
- e. None of the above

In database systems, durability is the ACID property which guarantees that transactions that have committed will survive permanently. For example, if a flight booking reports that a seat has successfully been booked, then the seat will remain booked even if the system crashes.

7. In CAP theorem, also known Brewer's theorem, the CAP stands for

- a. Consistency, Atomicity, Procedure
- b. Consistency, Atomicity, Partition
- c. Consistency, Availability, Partition
- d. **Consistency, Availability, Partition tolerance**
- e. None of above

In theoretical computer science, the CAP theorem, also known as Brewer's theorem, states that it is impossible for a distributed computer system to simultaneously provide all three of the following guarantees:[1][2][3]

- *Consistency (all nodes see the same data at the same time)*
- *Availability (a guarantee that every request receives a response about whether it succeeded or failed)*
- *Partition tolerance (the system continues to operate despite arbitrary partitioning due to network failures)*

8. CAP theorem states that it is **impossible** for a distributed computer system to simultaneously provide all three of the following guarantees:

- all nodes see the same data at the same time
- every request receives a response about whether it succeeded or failed

- the system continues to operate despite arbitrary partitioning due to network failures

- True**
- False

9. BASE is an alternative to ACID, gives up on consistency and the BASE stands for: Basic Availability, Soft-state, and Eventual consistency

- True
- False

10. In BASE , **Basic Availability** means that the system does not guarantee availability, in terms of the CAP theorem.

- True
- False

11. In BASE, **Soft state** indicates that the state of the system may change over time, even without input. This is because of the eventual consistency model.

- True**
- False

A BASE system gives up on consistency.

- **Basically available** indicates that the system does guarantee availability, in terms of the CAP theorem.
- **Soft state** indicates that the state of the system may change over time, even without input. This is because of the eventual consistency model.
- **Eventual consistency** indicates that the system will become consistent over time, given that the system doesn't receive input during that time.

12. In BASE, **Eventual consistency** indicates that the system will become consistent over time, given that the system doesn't receive input during that time.

- True**
- False

13. **Database normalization** (or normalisation) is the process of organizing the columns (attributes) and tables (relations) of a relational **database** to minimize data redundancy. It is a rule you have to follow in ERD design.

- True
- False**

Database normalization (or normalisation) is the process of organizing the columns (attributes) and tables (relations) of a relational database to minimize data redundancy.

Normalization involves decomposing a table into less redundant (and smaller) tables without losing information; defining foreign keys in the old table referencing the primary keys of the new ones. The objective is to isolate data so that additions, deletions, and modifications of an attribute can be made in just one table and then propagated through the rest of the database using the defined foreign keys.

14. Denormalization will cause duplication of data, and lead to wide row, but with less joins

- a. **True**
- b. False

In computing, denormalization is the process of attempting to optimize the read performance of a database by adding redundant data or by grouping data. In some cases, denormalization is a means of addressing performance or scalability in relational database software.

15. A database view is a virtual table or logical table, which is defined as a SQL SELECT query with joins.

- a. True
- b. False

*In SQL, a **view** is a virtual table based on the result-set of an SQL statement. A **view** contains rows and columns, just like a real table. The fields in a **view** are fields from one or more real tables in the **database**.*

16. The advantages of database views are

- a. simplified query
 - b. computed columns
 - c. increased data access security
 - d. extra layer of data abstraction on top of tables
 - e. **All of above**
- *A database view allows you to simplify complex queries: a database view is defined by an SQL statement that associates with many underlying tables. You can use database view to hide the complexity of underlying tables to the end-users and external applications. Through a database view, you only have to use simple SQL statements instead of complex ones with many joins.*
 - *A database view helps limit data access to specific users. You may not want a subset of sensitive data can be queryable by all users. You can use a database view to expose only non-sensitive data to a specific group of users.*
 - *A database view provides extra security layer. Security is a vital part of any relational database management system. The database view provides extra security for a database management system. The database view allows you to create read-only view to expose read-only data to specific users. Users can only retrieve data in read-only view but cannot update it.*
 - *A database view enables computed columns. A database table should not have calculated columns however a database view should. Suppose in the orderDetails table you have quantityOrder (the number of ordered products)*

and priceEach (price per product item) columns. However, the orderDetails table does not have computed column to store total sales for each line item of the order. If it has, the database schema would not be a good design. In this case, you can create a computed column named total , which is a product of quantityOrder and priceEach to represent the computed result. When you query data from the database view, the data of the computed column is calculated on fly.

- *A database view enables backward compatibility. Suppose you have a central database, which many applications are using it. One day, you decide to redesign the database to adapt with the new business requirements. You remove some tables and create new tables, and you don't want the changes affect other applications. In this scenario, you can create database views with the same schema as the legacy tables that you will remove.*

17. The main disadvantages of database views are slow performance and table dependency

- a. **True**
- b. False

- *Performance: querying data from a database view can be slow especially if the view is created based on other views.*
- *Tables dependency: you create view based on underlying tables of the a database. Whenever you change the structure of those tables that view associates with, you have to change the view as well.*

18. ERD typically consists of

- a. Entity
- b. Relationship
- c. Cardinality
- d. Entity Attributes
- e. **All of Above**

An entity-relationship diagram, or ERD, is a chart that visually represents the relationship between database entities. ERDs model an organization's data storage requirements with three main components: entities, attributes, and relationships.

19. When we design ERD, we focus on modeling the data, but not the query for Relational Database

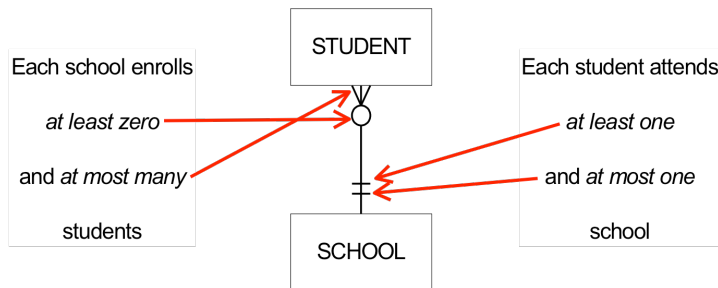
- a. **True**
- b. False

20. When designing ERD, you decide on the cardinal relationship (1-to-1, 1-to-many, many-to-many) based on the following:

- a. business requirements
- b. lifetime of entities
- c. dependency (owning or being owned) relationship of entities
- d. optional or mandatory relations among entities
- e. all of the above

21. The following ERD relationship between school and student is

- a. 1-to-many mandatory
- b. 1-to-many optional**
- c. 1-to-1 mandatory
- d. 1-to-1 optional
- e. many-to-many optional



22. [?] To model cardinality relationship of entities, you have to define Primary Key for the entities in MySQL workbench

- a. True**
- b. False

23. [?] ERD design might be different from your actual database design

- a. True**
- b. False

24. You can use Forward Engineer under Database menu in MySQL workbench to create the database based on your ERD design

- a. True**
- b. False

Use **forward engineering** to export your schema design to a **MySQL** server. Select the model that you wish to **forward engineer** and then choose the Database, **Forward Engineer...** menu item from the main menu. The first step of the process is to connect to a **MySQL** server to create the new database schema.

25. You have to create a database connection under MySQL workbench if you use Forward Engineer under Database menu

- a. True**
- b. False

26. [?] When you do SQL UPDATE and no row found for WHERE clause, nothing will happen

- a. True
- b. False

27. Which MySQL command can be used for data backup

- a. mysql
- b. mysqladmin
- c. **mysqldump**
- d. show
- e. none of above

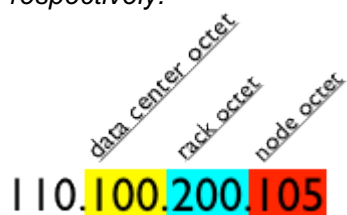
28. Database sharding can be defined as a horizontal partition of data in a database or search engine. Each individual partition is referred to as a shard or database shard. Each shard is held on a separate database server instance, to spread load.

- a. **True**
- b. False

29. [?] In database clustering, IP address Rack Referring is used for locating the cluster node: 10.20.30.1 (first octet meaningless, 2nd data center, 3rd rack, 4th is the node)

- a. True
- b. False

The RackInferringSnitch determines the location of nodes by rack and data center, which are assumed to correspond to the 3rd and 2nd octet of the node's IP address, respectively.



30. If you have over 1 billions of rows in a MySQL table, you need to consider using MySQL sharding, MySQL cluster or NoSQL database

- a. **True**
- b. False

31. On Linux, MySQL can be run on the following file system

- a. ext4,
- b. xfs
- c. reiser4

- d. ZFS
- e. All of above**

32. Peer to peer or master slave replication can be used for

- a. Scale-out for better performance
- b. Data redundancy
- c. Data analytics on slave without affecting master
- d. Long distance data distribution
- e. All of Above**

33. MySQL cluster can offer the following benefits

- a. High performance
- b. High Availability
- c. Auto sharding
- d. Both SQL and NoSQL API
- e. All of above**

34. Which of the following can PHP NOT do?

- a. It can modify HTML pages after the user loads the page without using JavaScript.**
- b. It can create custom content based on different variables.
- c. It can write or read information to databases if partnered with a database language.
- d. It is excellent at tracking user information.
- e. It can write files to the server

35. The port number for a web server can be changed by editing its configuration file

- a. True**
- b. False

36. The Web server stores all of the files necessary to display web pages at a specific directory path on the Web server machine -- typically all the individual pages that comprise the entirety of a Web site, any images/graphic files and any scripts (such as PHP) that make dynamic elements of the site function. The specific directory path can not be changed.

- a. True
- b. False**

37. In Windows, Environment variables (System or local) specify search paths for executable binary software files. If you do not give the path to the new software you installed, your command line tool usually cannot run it.

- a. True
 - b. False
38. The fundamental difference in form method GET and POST is: GET displays the form values entered in the URL of the address bar where as POST does not
- a. True
 - b. False
39. In PHP, the variable name \$fname-lname is illegal?
- a. True
 - b. False
40. Which one is correct to log into MySQL as user svu?
- a. mysql -uroot -p
 - b. mysql -usvu -p
 - c. mysql -uuser -p
 - d. mysql
 - e. All of above
41. With SQL, how do you change database user svu's password to "svu2015"?
- a. UPDATE user set password = "svu2015";
 - b. UPDATE user set password = "svu2015" WHERE user = "svu";
 - c. UPDATE user set password = password("svu2015");
 - d. UPDATE user set password = password("svu2015") WHERE user = "svu";
 - e. None of above
42. If your local MySQL database cannot be started, the most likely reason is:
- a. No write permission on MySQL database directory
 - b. The default MySQL port 3306 has been used by another running process
 - c. The Web Server has not been started yet
 - d. Either a or b or both
 - e. Either b or c or both
43. DHTML is the combination of
- a. HTML
 - b. javascript
 - c. CSS
 - d. HTML DOM
 - e. All of the above

44. DOM stands for?

- a. Document on model
- b. Data object model
- c. Document oriented model
- d. Document object model
- e. Data oriented model

45. HTML5 can be used for mobile applications?

- a. True
- b. False

46. Web browser cache is used for?

- a. Offline browsering
- b. Speed
- c. Reduced web server load
- d. a, b and c
- e. None of the above

47. What is the root directory called for a web server ?

- a. Home
- b. Root
- c. Absolute path
- d. Relative path
- e. None of the above

48. Which bash command is used to change to a different directory?

- a. change
- b. change_directory
- c. cd
- d. pwd
- e. None of the above

49. Which bash command is used to list process status?

- a. process -ef
- b. ps -ef
- c. ls -ef
- d. pwd -ef
- e. None of the above

50. Which bash command is used to change a owner of a file?

- a. chmod

- b. chown
- c. changeown
- d. changeowner
- e. None of the above

51. Which bash command is used to change a file's user access permission ?

- a. chmod
- b. chown
- c. changeown
- d. changeowner
- e. None of the above

52. Which bash command is used to search a keyword from input files?

- a. search
- b. keyword
- c. grep
- d. ls
- e. None of the above

53. The bash command mv is ONLY used to move a file to an existing directory

- a. True
- b. False

54. To terminate a running process in linux, you can use terminate command

- a. True
- b. False

55. Which bash command is used to change the permission of all the files under current directory to rwxr--r—

- a. chmod 777 *
- b. chmod 744 ***
- c. chmod 751 *
- d. chmod 761 *
- e. None of the above

56. In vi, Esc key must be used to switch to command mode

- a. True
- b. False

57. In vi, which keys are used to move cursor around?

- a. h j k l

- b. w b
- c. 0 \$
- d. ctr-f ctr-b
- e. All of the above

58. In vi, which of the following change the foo to bar for all lines?

- a. In command mode, type :0,\$s/foo/bar/g
- b. In command mode, type :10,20s/foo/bar/g
- c. In command mode, type :.,\$s/foo/bar/g
- d. In command mode, type :.,+10s/foo/bar/g
- e. None of the above

59. Which command is used to add/edit a cron job?

- a. cron -e
- b. cron -l
- c. crontab -e
- d. crontab -l
- e. None of above

60. You want to backup your database at 3:00am every day using backup.sh, which crontab is correct?

- a. * * * * * db_backup.sh
- b. 00 03 00 00 00 db_backup.sh
- c. 00 03 * * * db_backup.sh
- d. @daily db_backup.sh
- e. None of the above