MCQ

1. There are similarities between the instructor entity set and the secretary entity set in the sense that they have several attributes that are conceptually the same across the two entity sets: namely, the identifier, name, and salary attributes. This process is called  
a) Commonality  
b) Specialization  
c) Generalization  
d) Similarity

2. . A \_\_\_\_\_\_\_\_\_\_\_\_\_ constraint requires that an entity belong to no more than one lower-level entity set.  
a) Disjointness  
b) Uniqueness  
c) Special  
d) Relational

3. The completeness constraint may be one of the following: Total generalization or specialization, Partial generalization or specialization. Which is the default?  
a) Total  
b) Partial  
c) Should be specified  
d) Cannot be determined

4.  The function that an entity plays in a relationship is called that entity’s \_\_\_\_\_\_\_\_\_\_\_\_\_  
a) Participation  
b) Position  
c) Role  
d) Instance

5.  The attribute AGE is calculated from DATE\_OF\_BIRTH. The attribute AGE is  
a) Single valued  
b) Multi valued  
c) Composite  
d) Derived

**6.** Which of the following can be a multivalued attribute?  
a) Phone\_number  
b) Name  
c) Date\_of\_birth  
d) All of the mentioned

7.  Data integrity constraints are used to:  
a) Control who is allowed access to the data  
b) Ensure that duplicate records are not entered into the table  
c) Improve the quality of data entered for a specific property  
d) Prevent users from changing the values stored in the table

8.  Which of the following can be addressed by enforcing a referential integrity constraint?  
a) All phone numbers must include the area code  
b) Certain fields are required (such as the email address, or phone number) before the record is accepted  
c) Information on the customer must be known before anything can be sold to that customer  
d) Then entering an order quantity, the user must input a number and not some text (i.e., 12 rather than ‘a dozen’)

9. Which one of the following uniquely identifies the elements in the relation?  
a) Secondary Key  
b) Primary key  
c) Foreign key  
d) Composite key

10. The entity relationship set is represented in E-R diagram as  
a) Double diamonds  
b) Undivided rectangles  
c) Dashed lines  
d) Diamond

11) What are the three steps of normalization to third normal form for databases?

A. Identify the primary key, select secondary keys, and define relationships.

B. =Remove repeating groups, remove partial dependencies, and remove transitive dependencies.

C. Define entities, select relationships, and define attributes.

D. None of the above is correct.

12) A \_\_\_\_\_ contains records that contain day-to-day business and operational data.

A. transaction file

B. work file

C. table file

D. master file

13) Review the following output :

which of the following SQL statements likely produced the output above:

A. select deptno || ' ' || dname || ' in ' || loc Departments from dept;

B. select deptno || “ “ || dname || “ in “ || loc DEPARTMENT from dept;

C. select deptno || ' ' || ‘dname’ || ' in ' || loc DEPARTMENT from dept;

D. select dname || ' ' || deptno || in || loc departments from dept;

14) you can use MAX and MIN functions for:

A. Date data type.

B. Numeric data type.

C. Character data type.

D. Any data type.

15) You can Place subquery in.

A. where clause

B. having clause

C. from clause.

D. All of the above.

16) when you need to display all the possible combinations of rows from multiple tables, we use.

A. Outer join

B. Self join

C. Cartesian product

D. Non equijoin.

17) In a self join query, a table is joined to itself by using:

A. Non-Equijoins to treat the tables as two separate tables.

B. Equijoins to treat the tables as two separate tables.

C. Table aliases to treat the tables as two separate tables.

D. Non of the above

18) Review the following output :

A. SQL> SELECT deptno, AVG(sal( FROM emp GROUP BY deptno having avg(sal) >2000 B. SQL> select deptno, AVG(sal) FROM emp WHERE AVG(sal) > 2000

GROUP BY deptno;

C. SQL> SELECT deptno, AVG(sal) FROM emp GROUP BY avg(sal) having avg(sal) >2000;

D. SQL> SELECT deptno, AVG(sal) FROM emp where sal>1500 GROUP BY deptno having avg(sal)>2000;

19) Database transaction end with one of the following events:

A. COMMIT or ROLLBACK is issued

B. DDL or DCL statement executes (automatic commit)

C. User exits

D. all of the above.

20) You can change a column’s datatype, size, and default value by using.

A. alter statement.

B. Modify statement.

C. Resize statement.

D. Update statement

21) 1. A \_\_\_\_\_\_\_\_\_\_\_\_\_ constraint requires that an entity belong to no more than one lower-level entity set.

a) Disjointness

b) Uniqueness

c) Special

d) Relational

22) 2. Functional dependencies are a generalization of

a) Key dependencies

b) Relation dependencies

c) Database dependencies

d) None of the mentioned

23) 3. The attribute name could be structured as an attribute consisting of first name, middle initial, and last name. This type of attribute is called

a) Simple attribute

b) Composite attribute

c) Multivalued attribute

d) Derived attribute

24) The attribute AGE is calculated from DATE\_OF\_BIRTH. The attribute AGE is

a) Single valued

b) Multi valued

c) Composite

d) Derived

25)Which of the following is a single valued attribute

a) Register\_number

b) Address

c) SUBJECT\_TAKEN

d) Reference

26) Aggregate functions are functions that take a \_\_\_\_\_\_\_\_\_\_\_ as input and return a single value.

a) Collection of values b) Single value

c) Aggregate value d) Both Collection of values & Single value

26) A Boolean data type that can take values true, false, and\_\_\_\_\_\_\_\_

a) 1 b) 0 c) Null d) Unknown

27. We can test for the nonexistence of tuples in a subquery by using the \_\_\_\_\_ construct.

a) Not exist b) Not exists c) Exists d) Exist

28. Tables in second normal form (2NF):

a) Eliminate all hidden dependencies b) Eliminate the possibility of a insertion anomalies

c) Have a composite key d) Have all non key fields depend on the whole primary key

29. Which of the following terms does refer to the correctness and completeness of the data in a database?

a) Data security b) Data constraint

c) Data independence d) Data integrety

30. Count function in SQL returns the number of

(A)rows. (B) distinct values. (C) groups. (D) column

1. what is database management systems ? Discuss different applications of DBMS ?

A database management system (DBMS) is system software for creating and managing [databases](https://searchsqlserver.techtarget.com/definition/database). The DBMS provides users and programmers with a systematic way to create, retrieve, update and manage [data](https://searchdatamanagement.techtarget.com/definition/data).

**Application and Uses of Database Management System (DBMS)**

**Railway Reservation System**

Database is required to keep record of ticket booking, train’s departure and arrival status. Also if trains get late then people get to know it through database update.

**Library Management System**

There are thousands of books in the library so it is very difficult to keep record of all the books in a copy or register. So DBMS used to maintain all the information relate to book issue dates, name of the book, author and availability of the book.

Also See: [Role, Duties and Responsibilities of DBA](http://whatisdbms.com/role-duties-and-responsibilities-of-database-administrator-dba/#sthash.9qFgVpJh.dpbs)

**Banking**

We make thousands of transactions through banks daily and we can do this without going to the bank. So how banking has become so easy that by sitting at home we can send or get money through banks. That is all possible just because of DBMS that manages all the bank transactions.

**Universities and colleges**

Examinations are done online today and universities and colleges maintain all these records through DBMS. Student’s registrations details, results, courses and grades all the information are stored in database.

**Credit card transactions**

For purchase of credit cards and all the other transactions are made possible only by DBMS. A credit card holder knows the importance of their information that all are secured through DBMS.

Also See: [What is Database?](http://whatisdbms.com/what-is-a-database/)

**Social Media Sites**

We all are on social media websites to share our views and connect with our friends. Daily millions of users signed up for these social media accounts like facebook, twitter, pinterest and Google plus. But how all the information of users are stored and how we become able to connect to other people, yes this all because DBMS.

**Telecommunications**

Any telecommunication company cannot even think about their business without DBMS. DBMS is must for these companies to store the call details and monthly post paid bills.

**Finance**

Those days have gone far when information related to money was stored in registers and files. Today the time has totally changed because there are lots f thing to do with finance like storing sales, holding information and finance statement management etc.

**Military**

Military keeps records of millions of soldiers and it has millions of files that should be keep secured and safe. As DBMS provides a big security assurance to the military information so it is widely used in militaries. One can easily search for all the information about anyone within seconds with the help of DBMS.

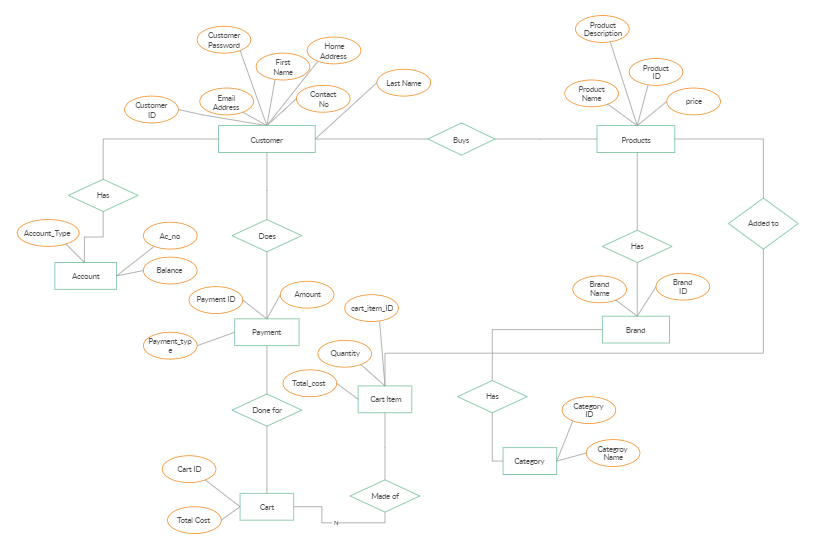
**Online Shopping**

Online shopping has become a big trend of these days. No one wants to go to shops and waste his time. Everyone wants to shop from home. So all these products are added and sold only with the help of DBMS. Purchase information, invoice bills and payment, all of these are done with the help of DBMS.

**Human Resource Management**

Big firms have many workers working under them. Human resource management department keeps records of each employee’s salary, tax and work through DBMS.

1. Construct and ER diagram of any online shopping retail store.



1. Define integrity constraint? Discuss domain constrain with suitable example .

**Integrity constraints** are a set of data validation rules that you can specify in order to restrict the data values that can be stored for a variable in a SAS data file.**Integrity constraints** help you preserve the validity and consistency of your data.

**Definition**: Domain constraints are **user defined data type** and we can define them like this:  
Domain Constraint = data type + Constraints (NOT NULL / UNIQUE / PRIMARY KEY / FOREIGN KEY / CHECK / DEFAULT)

**Example**:  
For example I want to create a table “student\_info” with “stu\_id” field having value greater than 100, I can create a domain and table like this:

create domain **id\_value** int

constraint id\_test

check(value > 100);

create table student\_info (

stu\_id **id\_value** PRIMARY KEY,

stu\_name varchar(30),

stu\_age int

);

1. With the information given below, calculate any three members of F+ .
2. Discuss 2NF and 3NF with suitable example.

## Second normal form (2NF)

A table is said to be in 2NF if both the following conditions hold:

* Table is in 1NF (First normal form)
* No non-prime attribute is dependent on the proper subset of any candidate key of table.

An attribute that is not part of any candidate key is known as non-prime attribute.

**Example**: Suppose a school wants to store the data of teachers and the subjects they teach. They create a table that looks like this: Since a teacher can teach more than one subjects, the table can have multiple rows for a same teacher.

|  |  |  |
| --- | --- | --- |
| teacher\_id | subject | teacher\_age |
| 111 | Maths | 38 |
| 111 | Physics | 38 |
| 222 | Biology | 38 |
| 333 | Physics | 40 |
| 333 | Chemistry | 40 |

**Candidate Keys**: {teacher\_id, subject}  
**Non prime attribute**: teacher\_age

**Third Normal form (3NF)**

A table design is said to be in 3NF if both the following conditions hold:

* Table must be in 2NF
* [Transitive functional dependency](https://beginnersbook.com/2015/04/transitive-dependency-in-dbms/) of non-prime attribute on any super key should be removed.

An attribute that is not part of any [candidate key](https://beginnersbook.com/2015/04/candidate-key-in-dbms/) is known as non-prime attribute.

In other words 3NF can be explained like this: A table is in 3NF if it is in 2NF and for each functional dependency X-> Y at least one of the following conditions hold:

* X is a [super key](https://beginnersbook.com/2015/04/super-key-in-dbms/) of table
* Y is a prime attribute of table

An attribute that is a part of one of the candidate keys is known as prime attribute.

**Example**: Suppose a company wants to store the complete address of each employee, they create a table named employee\_details that looks like this:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| emp\_id | emp\_name | emp\_zip | emp\_state | emp\_city | emp\_district |
| 1001 | John | 282005 | UP | Agra | Dayal Bagh |
| 1002 | Ajeet | 222008 | TN | Chennai | M-City |
| 1006 | Lora | 282007 | TN | Chennai | Urrapakkam |
| 1101 | Lilly | 292008 | UK | Pauri | Bhagwan |
| 1201 | Steve | 222999 | MP | Gwalior | Ratan |

**Super keys**: {emp\_id}, {emp\_id, emp\_name}, {emp\_id, emp\_name, emp\_zip}…so on  
**Candidate Keys**: {emp\_id}  
**Non-prime attributes**: all attributes except emp\_id are non-prime as they are not part of any candidate keys.

6. Consider the following supplier database, where primary keys are underlined .

Supplier (supplier\_id, supplier\_name, city)

Supplies (supplier\_id, part\_id, quantity)

Parts (part\_id, part\_name, color, weight)

Construct the following relational database and write the SQL queries.

a) Write a query to create the above table

b) Find the name of all supplies located in city "kathmandu".

c) find the name of all parts that are supplied by "ABC Company";

d) find the name of all suppliers who supply more than 30 different parts.

7. What is serializable schedule ? How can you test a schedule for confilct serializability ?

8. Discuss recovery techniques based on deferred update with concurrent execution in multi-user environment.

**Group 'C'**

1. sample database application, called COMPANY, which serves to illustrate the basic ER model concepts and their use in schema design. The COMPANY database keeps track of a company’s employees, departments, and projects. Suppose that after the requirements collection and analysis phase, the database designers provide the following description of the mini-world—the part of the company that will be represented in the database.

The company is organized into departments. Each department has a unique name, a unique number, and a particular employee who manages the department. We keep track of the start date when that employee began managing the department. A department may have several locations.

A department controls a number of projects, each of which has a unique name, a unique number, and a single location.

We store each employee’s name, Social Security number, address, salary, sex (gender), and birth date. An employee is assigned to one department, but may work on several projects, which are not necessarily controlled by the same department. We keep track of the current number of hours per week that an employee works on each project. We also keep track of the direct supervisor of each employee (who is another employee).

We want to keep track of the dependents of each employee for insurance purposes. We keep each dependent’s first name, sex, birth date, and relationship to the employee.

2. Sailors(*sid:* integer, *sname:* string, *rating:* integer, *age:* real)

Boats(*bid:* integer, *bname:* string, *color:* string)

Reserves(*sid:* integer, *bid:* integer, *day:* date

a. find the sum of rating of all sailors.

b. find average age of all sailors with a rating of 9.

c. find the age of the youngest sailors for each rating level.

d. suppose we need to insert a new record of Sailors of id is11, name is “Rahul”, rating is 9 and of age is 29 then we write following SQL query

e. Remove all tuples of Sailors whose age is less than 30 and rating greater than 7

3. What is transaction? Explain concurrent transactions with example.