Assignment Day 5–SQL: Comprehensive practice

# Answer following questions

1. What is an object in SQL?
2. SQL objects are schemas, journals, catalogs, tables, aliases, views, indexes, constraints, triggers, masks, permissions, sequences, stored procedures, user-defined functions, user-defined types, global variables, and SQL packages. SQL creates and maintains these objects as system objects.
3. What is Index? What are the advantages and disadvantages of using Indexes?
4. Indexes are special lookup tables that the database search engine can use to speed up data retrieval.  The advantages of using indexes is that it improves searching, sorting and grouping performance and the disadvantages are that it requires extra space and insert, update and delete operations become slow.
5. What are the types of Indexes?
6. An index can be clustered or non-clustered.
7. Does SQL Server automatically create indexes when a table is created? If yes, under which constraints?
8. Yes, under primary key constraint and unique constraint
9. Can a table have multiple clustered index? Why?
10. No, because the data rows themselves can be stored in only one order.
11. Can an index be created on multiple columns? Is yes, is the order of columns matter?
12. Yes, an index can be created on multiple columns and the order of columns does matter.
13. Can indexes be created on views?
14. Yes
15. What is normalization? What are the steps (normal forms) to achieve normalization?
16. Normalization is a database design technique that reduces data redundancy and eliminates undesirable characteristics like Insertion, Update and Deletion Anomalies. The normalization forms are 1nf,2nf,3nf and bcnf
17. What is denormalization and under which scenarios can it be preferable?
18. Denormalization is a database optimization technique in which we add redundant data to one or more tables, denormalization is preferable when there is a large amount of data and a lot of joins are required to retrieve data.
19. How do you achieve Data Integrity in SQL Server?
20. Data integrity can be achieved using constraints on table columns.
21. What are the different kinds of constraint do SQL Server have?
22. Different kind of constraints are not null, unique, primary key and check
23. What is the difference between Primary Key and Unique Key?
24. A primary key does not allow null value while a unique key allows one null value.
25. What is foreign key?
26. A foreign key is a column or group of columns in a relational database table that provides a link between data in two tables.
27. Can a table have multiple foreign keys?
28. Yes
29. Does a foreign key have to be unique? Can it be null?
30. A foreign key does not have to be unique and it can also be null
31. Can we create indexes on Table Variables or Temporary Tables?
32. Indexes can be created on temporary tables but not on Table variables.
33. What is Transaction? What types of transaction levels are there in SQL Server?
34. A transaction is a unit of work that is performed against a database. Transactions are units or sequences of work accomplished in a logical order.

# Write queries for following scenarios

1. Write an sql statement that will display the name of each customer and the sum of order totals placed by that customer during the year 2002

Create table customer(cust\_id int, iname varchar (50)) create table order(order\_id int,cust\_id int,amount money,order\_date smalldatetime)

select c.iname,count(o.order\_id) as "total orders" from customer c inner join order o on o.cust\_id = c.cust\_id where year(o.order\_date) = 2002 group by c.iname;

2. The following table is used to store information about company’s personnel:

Create table person (id int, firstname varchar(100), lastname varchar(100)) write a query that returns all employees whose last names start with “A”.

select \* from person where lastname like 'a%';

3. The information about company’s personnel is stored in the following table:

Create table person(person\_id int primary key, manager\_id int null, name varchar(100)not null) The filed managed\_id contains the person\_id of the employee’s manager.

Please write a query that would return the names of all top managers(an employee who does not have a manger, and the number of people that report directly to this manager.

select p2.person\_id,count(p1.person\_id) as "subordinates" from person p1 left join person p2 on p1.manager\_id=p2.person\_id where p1.manager\_id is null group by p2.person\_id ;

4. List all events that can cause a trigger to be executed.

Insert, update, delete are events can cause a trigger to be executed

5. Generate a destination schema in 3rd Normal Form. Include all necessary fact, join, and dictionary tables, and all Primary and Foreign Key relationships. The following assumptions can be made:

a. Each Company can have one or more Divisions.

b. Each record in the Company table represents a unique combination

c. Physical locations are associated with Divisions.

d. Some Company Divisions are collocated at the same physical of Company Name and Division Name.

e. Contacts can be associated with one or more divisions and the address, but are differentiated by suite/mail drop records.status of each association should be separately maintained and audited.

create table locations(loc\_id int primary key,location\_name varchar(30));

create table division (div\_id int primary key,div\_name varchar(30),loc\_id int foreign key references locations)

create table company (company\_id int primary key,company\_name varchar(30) not null,div\_id int foreign key references division, CONSTRAINT company\_details Unique(company\_id,company\_name,div\_id));

create table contact (contact\_id int primary key,mail varchar(30) unique not null,div\_id int foreign key references division,loc\_id int foreign key references locations);

GOOD LUCK.