**1) What is a table expression? Can you give a technical definition of a table expression?**

-A table expression is a named query expression that represents a valid relational table. Table expressions are used to simplify complex joins and subqueries and to provide a means to query hierarchical data such as an organizational chart.

**2) In what SQL clause are derived tables (table valued subqueries) located?**

-Derived tables are located within the FROM clause of an outer query.

**3) Why can you refer to column aliases in an outer query that you defined in an inner table valued subquery?**

-You can refer to column aliases in an outer query that were defined in an inner table valued subquery because the ability to reference aliases comes strictly from being able to use table expressions. The subquery is also ran first.

**4) What SQL key word defines a common table expression?**

-The WITH keyword.

**5) When using common table expressions, can a subsequent derived table use a table alias declared in a preceding table expression?**

-Yes, because it runs the subquery.

**6) Can a main query refer to a previously defined common table expression by multiple aliases?**

-Yes, because each CTE represents a separate table that the machine retains in memory.

**7) In SQL, is a view a durable object?**

-In SQL, views are durable objects because they are reusable and the query is stored.

**8) In a view, what does the “WITH CHECK OPTION” do? Why is this important?**

-The “WITH CHECK OPTION” is an optional clause of the CREATE VIEW statement. It prevents a view from updating or inserting rows that are not visible through it. This is important because it prevents data from being altered that could potentially mess up your table(s).

**9) In a view, what does the “SCHEMABINDING” do? Why is this important?**

-The “SCHEMABINDING” option binds the schema of referenced objects and columns to the schema of the referencing object. This is important because it leads to improved performance and it can be used to prevent any inadvertent modifications to the objects referenced by the module.

**10) What is a table valued function?**

-A TVF is a user-defined function that returns data of a table type. The return type of a table-valued function is a table, therefore, you can use the table-valued function just like you would use a table. It is a reusable expression that supports input parameters.

**11) What does the “APPLY” operator do?**

-The APPLY operator is used to join a table to a TVF so the function is evoked for each row returned from the table.

**12) What are the two forms of the “APPLY” operator? Give an example of each.**

-The two forms of the APPLY operator are CROSS APPLY and OUTER APPLY. CROSS APPLY applies the right table to each row from the left table and produces a result table with the unified result sets. The OUTER APPLY returns all the rows from the outer table, whether or not the function returns data for a specific row.

An example of a CROSS APPLY is:

SELECT S.shipperid, E.empid

FROM Sales.Shippers AS S

CROSS JOIN HR.Employees AS E;

SELECT S.shipperid, E.empid

FROM Sales.Shippers AS S

CROSS APPLY HR.Employees AS E;

An example of an OUTER APPLY is:

SELECT C.custid, A.orderid, A.orderdate

FROM Sales.Customers AS C

OUTER APPLY

(SELECT TOP (3) orderid, empid, orderdate, requireddate

FROM Sales.Orders AS O

WHERE O.custid = C.custid

ORDER BY orderdate DESC, orderid DESC) AS A;