MCQ's in SQL

1. Which SQL command is used to retrieve data from a database?

a) INSERT
b) DELETE
c) SELECT
d) UPDATE

Answer: c) SELECT
Explanation:
The `SELECT` statement is used to retrieve data from a database table. Other commands like `INSERT`, `DELETE`, and `UPDATE` modify the data rather than retrieving it.

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2. What does the `WHERE` clause do in SQL?

a) Joins two tables
b) Filters records based on a condition
c) Sorts the result
d) Adds a new record

Answer: b) Filters records based on a condition
Explanation:
The `WHERE` clause is used to filter records that meet specific conditions. For example:

```
SELECT * FROM employees WHERE age > 30;
```

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3. What is the purpose of the `GROUP BY` clause?

a) To combine multiple tables
b) To filter records
c) To group rows with the same values in specified columns
d) To create a new table

Answer: c) To group rows with the same values in specified columns
Explanation:
`GROUP BY` groups rows that have the same values in specified columns and is commonly used with aggregate functions like `SUM`, `COUNT`, etc. For example:

```
SELECT department, COUNT(*)
FROM employees
GROUP BY department;
```

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4. Which of the following statements is true about `PRIMARY KEY`?

a) It allows duplicate values.
b) It allows NULL values.
c) It uniquely identifies each record in a table.
d) It is optional for all tables.

Answer: c) It uniquely identifies each record in a table.
Explanation:
The `PRIMARY KEY` constraint ensures that each record in a table is unique and non-null. A table can have only one primary key.

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5. What is the difference between `HAVING` and `WHERE` clauses?

a) `WHERE` works on groups, `HAVING` works on individual rows.
b) `HAVING` works on groups, `WHERE` works on individual rows.
c) Both are interchangeable.
d) `HAVING` is faster than `WHERE`.

Answer: b) `HAVING` works on groups, `WHERE` works on individual rows.
Explanation:
The `WHERE` clause filters rows before grouping, while `HAVING` filters groups after aggregation. For example:

```
SELECT department, COUNT(*)
FROM employees
WHERE salary > 50000
GROUP BY department
HAVING COUNT(*) > 10;
```

---

6. What is the result of this query?

```
sql
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SELECT 10 / 2;
```

a) 5
b) 5.0
c) Error
d) 0

Answer: a) 5
Explanation:
In SQL, integer division returns an integer result. Since both `10` and `2` are integers, the result is `5`.

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7. Which SQL clause is used to sort the result set?

a) ORDER BY
b) SORT
c) GROUP BY
d) WHERE

Answer: a) ORDER BY
Explanation:
The `ORDER BY` clause sorts the result set in ascending (`ASC`) or descending (`DESC`) order. For example:

```
SELECT * FROM employees ORDER BY salary DESC;
```

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8. What is a `JOIN` in SQL?

a) A way to combine rows from two or more tables based on a related column
b) A method to filter data
c) A command to delete data
d) A command to update data

Answer: a) A way to combine rows from two or more tables based on a related column
Explanation:
A `JOIN` combines rows from two or more tables based on a related column, such as a foreign key. Example of an inner join:

```
SELECT employees.name, departments.department_name
FROM employees
INNER JOIN departments
ON employees.department_id = departments.id;
```

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9. What does the `DISTINCT` keyword do?

a) Removes duplicate rows from the result set
b) Groups the data
c) Sorts the data
d) Filters data based on a condition

Answer: a) Removes duplicate rows from the result set
Explanation:
The `DISTINCT` keyword ensures that duplicate rows are eliminated from the result set. For example:

```
SELECT DISTINCT department FROM employees;
```

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10. What is the default sorting order in SQL?

a) Ascending
b) Descending

c) Random
d) None

Answer: a) Ascending
Explanation:
If the `ORDER BY` clause is used without specifying `ASC` or `DESC`, the result is sorted in ascending order by default.

11. Which operator is used to compare a value to a specified list of values?

a) LIKE
b) IN
c) BETWEEN
d) EXISTS

Answer: b) IN
Explanation:
The `IN` operator is used to filter records based on a list of specified values. For example:

```
SELECT * FROM employees WHERE department_id IN (1, 2, 3);
```

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12. What does the `COUNT(*)` function do?

a) Counts non-NULL values in a column
b) Counts NULL values in a column
c) Counts all rows in a table, including NULLs
d) Counts only distinct rows

Answer: c) Counts all rows in a table, including NULLs
Explanation:
`COUNT(*)` counts all rows in a table, including rows with NULL values.

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13. What is a foreign key?

a) A key that uniquely identifies a record in a table
b) A key used to establish and enforce a link between two tables
c) A temporary key for queries
d) A primary key from the same table

Answer: b) A key used to establish and enforce a link between two tables
Explanation:
A foreign key is a column or set of columns that establishes a relationship between tables, referencing a primary key in another table.

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14. Which SQL statement is used to add a new row to a table?

a) UPDATE
b) ADD
c) INSERT INTO
d) CREATE

Answer: c) INSERT INTO
Explanation:
The `INSERT INTO` statement is used to add new rows to a table. For example:

```
INSERT INTO employees (name, age, department) VALUES ('John', 30, 'IT');
```

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15. What will the following query return?

```
SELECT * FROM employees WHERE name LIKE '_a%';
```

a) Names starting with "a"
b) Names ending with "a"
c) Names where the second character is "a"
d) Names containing "a"

Answer: c) Names where the second character is "a"
Explanation:
The underscore (_) represents a single character, and `%` represents zero or more characters.

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16. What is a `UNION` in SQL?

a) Combines columns from two tables
b) Combines results of two queries without duplicates
c) Combines rows from two tables with duplicates
d) Removes duplicates from a table

Answer: b) Combines results of two queries without duplicates
Explanation:
The `UNION` operator combines results of two queries and removes duplicates. Use `UNION ALL` to include duplicates.

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17. Which SQL function is used to return the current date?

a) SYSDATE
b) CURRENT_DATE

c) GETDATE
d) All of the above

Answer: d) All of the above
Explanation:
Different databases have different functions: `SYSDATE` (Oracle), `CURRENT_DATE` (PostgreSQL, MySQL), and `GETDATE` (SQL Server).

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18. What does `TRUNCATE` do?

a) Deletes specific rows
b) Removes all rows but retains the table structure
c) Drops the table and its structure
d) Renames the table

Answer: b) Removes all rows but retains the table structure
Explanation:
`TRUNCATE` is faster than `DELETE` because it doesn't log individual row deletions.

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19. What does the `EXISTS` clause do?

a) Checks if a column exists in a table
b) Tests for the existence of rows in a subquery
c) Checks for duplicate rows
d) Filters NULL values

Answer: b) Tests for the existence of rows in a subquery
Explanation:
`EXISTS` returns true if the subquery returns one or more rows.

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20. What is a `VIEW` in SQL?

a) A temporary table
b) A virtual table based on a query
c) A table storing metadata
d) A permanent copy of a table

Answer: b) A virtual table based on a query
Explanation:
A `VIEW` is a virtual table created by a query and doesn't store data physically.

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21. What is the default value for the `ORDER BY` clause?

a) ASC
b) DESC
c) Random order
d) None

Answer: a) ASC
Explanation:
By default, `ORDER BY` sorts results in ascending order.

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22. How do you rename a table in SQL?

a) RENAME TO
b) ALTER TABLE
c) UPDATE TABLE
d) None of the above

Answer: b) ALTER TABLE
Explanation:
The `ALTER TABLE` statement can be used to rename a table in some databases:

```
ALTER TABLE old_table_name RENAME TO new_table_name;
```

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23. What will this query do?

```
SELECT name, COALESCE(phone, 'N/A') FROM employees;
```

a) Replace NULL values in the phone column with 'N/A'
b) Remove rows with NULL phone values
c) Group rows by phone
d) Return all rows with phone values

Answer: a) Replace NULL values in the phone column with 'N/A'
Explanation:
The `COALESCE` function returns the first non-NULL value from its arguments.

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24. What is the difference between `DELETE` and `TRUNCATE`?

a) `DELETE` is slower than `TRUNCATE`
b) `DELETE` removes specific rows, `TRUNCATE` removes all rows
c) `TRUNCATE` resets auto-increment counters
d) All of the above

Answer: d) All of the above
Explanation:
`TRUNCATE` is faster, removes all rows, and resets auto-increment counters, while `DELETE` removes specific rows.

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25. What does the `IS NULL` condition check?

a) If a column is empty
b) If a column has no value (NULL)
c) If a column has a default value
d) If a column is unique

Answer: b) If a column has no value (NULL)
Explanation:
The `IS NULL` condition checks if a column contains a `NULL` value.

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26. How do you find the maximum value in a column?

a) MAX()
b) GREATEST()
c) TOP()
d) HIGH()

Answer: a) MAX()
Explanation:
The `MAX()` function returns the highest value in a column.

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27. What does `LIMIT` do in SQL?

a) Limits the number of columns retrieved
b) Limits the number of rows retrieved
c) Limits the size of a table
d) Limits query execution time

Answer: b) Limits the number of rows retrieved
Explanation:
The `LIMIT` clause restricts the number of rows returned by a query. For example:

```
SELECT * FROM employees LIMIT 5;
```

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28. How do you combine columns in a query?

a) CONCAT()
b) GROUP()
c) JOIN()
d) UNION

Answer: a) CONCAT()
Explanation:
The `CONCAT()` function combines values from two or more columns into one. For example:

```
SELECT CONCAT(first_name, ' ', last_name) AS full_name FROM employees;
```

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29. What does `ALTER TABLE` do?

a) Modifies an existing table structure
b) Adds new rows to a table
c) Removes all rows from a table
d) Deletes a table

Answer: a) Modifies an existing table structure
Explanation:
`ALTER TABLE` is used to add, delete, or modify columns in an existing table.

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30. What is the purpose of the `INDEX` in SQL?

a) To organize data in a table
b) To increase query performance
c) To remove duplicate rows
d) To enforce constraints

Answer: b) To increase query performance
Explanation:
An `INDEX` improves the speed of data retrieval operations on a database table by allowing the database to find rows faster.