

Started on	Tuesday, 18 March 2025, 2:30 PM
State	Finished
Completed on	Tuesday, 18 March 2025, 2:38 PM
Time taken	8 mins 10 secs
Marks	17.00/20.00
Grade	85.00 out of 100.00

Question 1

Complete

Mark 0.00 out of 1.00

What is the maximum number of nodes in a binary tree of height `h` (where height is counted as the number of edges from root to the deepest node)?

- ☐ a. (h^2)
- ☒ b. $(2^h - 1)$
- ☐ c. $(2^{h+1} - 1)$
- ☐ d. $(h \log h)$

Question 2

Complete

Mark 1.00 out of 1.00

What is the output of the following function when applied to an undirected graph represented as an adjacency list?

Function BFS(Node start):

Queue Q

Add start to Q

While Q is not empty:

Node u = Q.dequeue()

print u

For each neighbor v of u:

If v is not visited:

Mark v as visited

Add v to Q

- ☐ a. Detection of cycles
- ☐ b. Depth-First Traversal
- ☐ c. Finding the minimum spanning tree
- ☒ d. Breadth First Traversal

Question 3

Complete

Mark 1.00 out of 1.00

Which of the following SQL statements is used to remove an entire table including its structure?

- ☐ a. ``DELETE TABLE Employees;``
- ☒ b. ``DROP TABLE Employees;``
- ☐ c. ``TRUNCATE TABLE Employees;``
- ☐ d. ``REMOVE TABLE Employees;``

Question 4

Complete

Mark 1.00 out of 1.00

Which of the following SQL commands can be used to modify the structure of an existing table?

- ☒ a. ``ALTER``
- ☐ b. ``UPDATE``
- ☐ c. ``CHANGE``
- ☐ d. ``MODIFY``

Question 5

Complete

Mark 1.00 out of 1.00

What will happen if we execute the following command?

`TRUNCATE TABLE Orders;`

- ☐ a. Deletes all rows and removes the table structure.
- ☒ b. Deletes all rows but retains the table structure.
- ☐ c. Returns an error if there are foreign key constraints.
- ☐ d. Deletes selected rows only.

Question 6

Complete

Mark 1.00 out of 1.00

Which SQL command is used to modify existing data in a table?

- ☒ a. ``UPDATE``
- ☐ b. ``INSERT``
- ☐ c. ``ALTER``
- ☐ d. ``MODIFY``

Question 7

Complete

Mark 1.00 out of 1.00

Consider the following SQL query:

```
UPDATE Employees
```

```
SET Salary = Salary + 5000
```

```
WHERE Department = 'HR';
```

What does this query do?

- ☒ a. Increases salary of only HR department employees by 5000.
- ☐ b. Throws an error due to the `WHERE` clause.
- ☐ c. Increases all employees' salary by 5000.
- ☐ d. Decreases salary of HR department employees by 5000.

Question 8

Complete

Mark 1.00 out of 1.00

What will happen if you execute the following SQL statement?

```
INSERT INTO Students (ID, Name) VALUES (101, 'John');
```

```
INSERT INTO Students (ID, Name) VALUES (101, 'Mike');
```

- ☐ a. Error due to missing `VALUES` keyword.
- ☒ b. Only the first row is inserted; the second one causes a Primary Key violation.
- ☐ c. Both rows will be inserted successfully.
- ☐ d. The second statement overwrites the first one.

Question 9

Complete

Mark 1.00 out of 1.00

Which SQL statement is used to give a user access to a database?

- ☐ a. `ACCESS`
- ☐ b. `ALTER`
- ☐ c. `REVOKE`
- ☒ d. `GRANT`

Question 10

Complete

Mark 1.00 out of 1.00

What will be the result of the following SQL statement?

REVOKE INSERT, UPDATE ON Employees FROM user1;

- ☐ a. `user1` loses SELECT privilege on `Employees`.
- ☐ b. `user1` loses all privileges on `Employees`.
- ☒ c. `user1` loses INSERT and UPDATE privileges on `Employees`.
- ☐ d. Nothing happens.

Question 11

Complete

Mark 1.00 out of 1.00

Which SQL command is used to permanently save a transaction?

- ☐ a. `SAVEPOINT`
- ☒ b. `COMMIT`
- ☐ c. `UPDATE`
- ☐ d. `ROLLBACK`

Question 12

Complete

Mark 1.00 out of 1.00

Consider the following pseudo-code for a function `func(Node root)` applied to a binary tree. What does it compute?

Function func(Node root):

if root is NULL:

return 0

return 1 + func(root.left) + func(root.right)

- ☐ a. Sum of all node values
- ☐ b. Maximum depth of the tree
- ☒ c. Number of nodes in the tree
- ☐ d. Height of the tree

Question 13

Complete

Mark 1.00 out of 1.00

Consider the following SQL sequence:

BEGIN;

UPDATE Employees SET Salary = Salary + 5000 WHERE Department = 'IT';

ROLLBACK;

- ☐ a. The salaries of IT employees will increase by 5000.
- ☒ b. No change will happen in the Employees table.
- ☐ c. Only half the rows get updated.
- ☐ d. An error occurs because 'ROLLBACK' cannot undo an 'UPDATE'.

Question 14

Complete

Mark 0.00 out of 1.00

Which of the following is always true for a full binary tree with 'n' nodes?

- ☐ a. The height of the tree is always 'log n'
- ☒ b. The tree is always balanced
- ☐ c. Every level is completely filled
- ☐ d. Every node has either 0 or 2 children

Question 15

Complete

Mark 1.00 out of 1.00

Given a BST, which of the following elements will always be found in the left subtree of a node with value 'x'?

- ☐ a. All elements in the tree
- ☐ b. Elements greater than 'x'
- ☐ c. Elements equal to 'x'
- ☒ d. Elements less than 'x'

Question 16

Complete

Mark 1.00 out of 1.00

What is the output of the following function when applied to a BST?

Function findMin(Node root):

if root is NULL:

return NULL

if root.left is NULL:

return root.data

return findMin(root.left)

- ☐ a. The sum of all nodes
- ☐ b. The height of the BST
- ☒ c. The minimum value in the BST
- ☐ d. The maximum value in the BST

Question 17

Complete

Mark 0.00 out of 1.00

What is the worst-case time complexity of deleting a node in an unbalanced BST with 'n' nodes?

- ☐ a. $O(1)$
- ☒ b. $O(\log n)$
- ☐ c. $O(n)$ 🙄
- ☐ d. $O(n \log n)$

Question 18

Complete

Mark 1.00 out of 1.00

Which of the following statements is true for Dijkstra's Algorithm?

- ☐ a. It guarantees the shortest path in all cases
- ☒ b. It works only for graphs with non-negative weights
- ☐ c. It works correctly with negative-weight cycles
- ☐ d. It finds the shortest path between all pairs of nodes

Question 19

Complete

Mark 1.00 out of 1.00

What is the time complexity of Depth-First Search (DFS) on a graph with `V` vertices and `E` edges using an adjacency matrix?

- ☐ a. $O(V + E)$
- ☐ b. $O(E \log V)$
- ☒ c. $O(V^2)$
- ☐ d. $O(V)$

Question 20

Complete

Mark 1.00 out of 1.00

Which traversal method should be used to determine if a directed graph contains a cycle?

- ☐ a. Breadth-First Search (BFS)
- ☐ b. Dijkstra's Algorithm
- ☒ c. Depth-First Search (DFS) with recursion stack
- ☐ d. Kruskal's Algorithm