Started on	Thursday, 27 November 2025, 12:24 PM
State	Finished
Completed on	Thursday, 27 November 2025, 12:40 PM
Time taken	16 mins 8 secs
Marks	15.00/25.00
Grade	**60.00** out of 100.00

Question 1

Complete

Mark 1.00 out of 1.00

A binary tree has n leaf nodes. The number of nodes with degree 2 in a full binary tree is:

- a. n + 1
- b. 2n – 1
- c. n – 1
- d. n

Question 2

Complete

Mark 0.00 out of 1.00

A binary tree node structure is defined as:struct Node {int data;struct Node *left, *right;};Which of the following is true?

- a. This query will produce an error since both cannot be used together.
- b. HAVING filters groups after aggregation.
- c. WHERE and HAVING are interchangeable.
- d. HAVING filters rows before grouping.

Question 3

Complete

Mark 0.00 out of 1.00

A circular queue of size 5 currently contains elements [10, 20, 30, 40] with front = 0 and rear = 3. After two dequeue operations and one enqueue(50), what will be the new values of front and rear (0-based indexing)?

- a. front = 1, rear = 0
- b. front = 2, rear = 0
- c. front = 2, rear = 4
- d. front = 3, rear = 1

Question 4

Complete

Mark 1.00 out of 1.00

A database designer decides to denormalize part of a schema. What could be the most likely reason for this decision?

- a. To enforce stronger foreign key constraints
- b. To reduce data redundancy
- c. To increase referential integrity
- d. To improve query performance by reducing joins

Question 5

Complete

Mark 0.00 out of 1.00

A table Employees has 10 million rows. Which of the following will improve query performance for searching an employee by email (unique field)?

- a. Creating a non-clustered index on email
- b. Storing all emails in uppercase format
- c. Creating a clustered index on email
- d. Using ORDER BY email in all queries

Question 6

Complete

Mark 1.00 out of 1.00

CONCAT, UPPER, LOWER, and SUBSTRING are used together as follows:SELECT CONCAT(UPPER(LEFT('servicenow', 1)), LOWER(SUBSTRING('SERVICENOW', 2))); What will be the output?

- a. SERVICE
- b. ServicenOW
- c. SERVICENOW
- d. Servicenow

Question 7

Complete

Mark 1.00 out of 1.00

Consider two tables: Orders(order_id, customer_id, order_date) and Customers(customer_id, customer_name). Which of the following queries retrieves customers who have not placed any orders?

- a. SELECT customer_name FROM Customers WHERE customer_id NOT IN (SELECT customer_id FROM Orders);
- b. SELECT customer_name FROM Customers NATURAL JOIN Orders;
- c. SELECT customer_name FROM Customers WHERE customer_id IN (SELECT customer_id FROM Orders);
- d. SELECT customer_name FROM Customers WHERE EXISTS (SELECT * FROM Orders WHERE Customers.customer_id = Orders.customer_id);

Question 8

Complete

Mark 1.00 out of 1.00

For a graph with V vertices and E edges, what is the time complexity of Breadth-First Search (BFS) using an adjacency list representation?

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

Question 9

Complete

Mark 1.00 out of 1.00

Given the following SQL
command:SELECT department_id, AVG(salary)FROM employeesWHERE hire_date > '2020-01-
01'GROUP BY department_idHAVING AVG(salary) > 80000;Which traversal order can be used to create a copy of the tree without using recursion?

- a. Preorder using a stack
- b. Inorder using a stack
- c. Level-order using a queue
- d. Postorder using a queue

Question 10

Complete

Mark 1.00 out of 1.00

If a table is in Third Normal Form (3NF), which of the following must be true?

- a. It has no partial dependency and no transitive dependency.
- b. All attributes are atomic, but partial dependencies may exist.
- c. It can still contain redundant data.
- d. Each non-key attribute depends on a part of the composite key.

Question 11

Complete

Mark 0.00 out of 1.00

In a directed acyclic graph (DAG), topological sorting is possible only if:

- a. The graph contains no cycles.
- b. Every vertex has equal indegree and outdegree.
- c. The graph is connected.
- d. The graph has no self-loops.

Question 12

Complete

Mark 0.00 out of 1.00

In a queue implemented using linked list, which operation is O(1)?

- a. Traversing the entire queue
- b. Deleting from front
- c. Inserting at rear
- d. Both A and B

Question 13

Complete

Mark 1.00 out of 1.00

In a relational database, which of the following ensures that changes made by one transaction are not visible to other transactions until committed?

- a. Atomicity
- b. Durability
- c. Isolation
- d. Consistency

Question 14

Complete

Mark 0.00 out of 1.00

In a singly linked list, deleting the last node requires traversal of the entire list. What is the time complexity of this operation if the list has n nodes?

a. O(n)
b. $O(n^2)$
c. O(log n)
d. O(1)

Question 15

Complete

Mark 1.00 out of 1.00

In SQL, which of the following statements about INNER JOIN and LEFT JOIN is correct?

a. LEFT JOIN performs faster than INNER JOIN always.
b. INNER JOIN returns only matching rows, while LEFT JOIN returns all rows from the left table, even if there are no matches.
c. Both return identical results in all cases.
d. LEFT JOIN returns only matching rows, while INNER JOIN returns all rows from both tables.

Question 16

Complete

Mark 0.00 out of 1.00

The ACID property that ensures a transaction leaves the database in a consistent state — even after system failure — is:

a. Durability
b. Isolation
c. Atomicity
d. Consistency

Question 17

Complete

Mark 0.00 out of 1.00

Two transactions T1 and T2 are running concurrently. T1 reads data that T2 later updates, but T1 doesn't re-read it. This is an example of:

a. Dirty Read
b. Non-repeatable Read
c. Lost Update
d. Phantom Read

Question 18

Complete

Mark 0.00 out of 1.00

What will be the output of the following query?SELECT LOCATE('ice', 'ServiceNow');

- a. 0
- b. 5
- c. 4
- d. 6

Question 19

Complete

Mark 1.00 out of 1.00

What will be the result of the following query?SELECT DATE_FORMAT('2025-11-10', '%d %M %Y');

- a. 10 November 2025
- b. 10-11-2025
- c. November 10 2025
- d. 2025/11/10

Question 20

Complete

Mark 1.00 out of 1.00

Which of the following MySQL functions returns the number of characters (not bytes) in a string?

- a. LENGTH()
- b. INSTR()
- c. CHAR_LENGTH()
- d. STRCMP()

Question 21

Complete

Mark 1.00 out of 1.00

Which of the following queries will correctly calculate the age of a student in years based on column dob?

- a. SELECT AGE(CURDATE(), dob) AS age FROM students;
- b. SELECT YEAR(CURDATE()) - YEAR(dob) AS age FROM students;
- c. SELECT DATEDIFF(CURDATE(), dob) / 365 AS age FROM students;
- d. SELECT TIMESTAMPDIFF(YEAR, dob, CURDATE()) AS age FROM students;

Question 22

Complete

Mark 1.00 out of 1.00

Which of the following statements about doubly linked lists is true?

- a. They require more memory per node than singly linked lists.
- b. Deletion of a given node requires traversal from the head node.
- c. They have faster search operations than singly linked lists.
- d. They cannot be traversed backwards.

Question 23

Complete

Mark 0.00 out of 1.00

Which of the following statements about indexing is FALSE?

- a. A primary key automatically creates a clustered index in most relational databases.
- b. Indexes can be created on views to improve join performance.
- c. Indexes improve query performance but may slow down INSERT and UPDATE operations.
- d. Composite indexes can speed up queries that filter by multiple columns.

Question 24

Complete

Mark 1.00 out of 1.00

Which traversal of a binary tree gives nodes in ascending order if the tree is a Binary Search Tree (BST)?

- a. Level Order
- b. Preorder
- c. Inorder
- d. Postorder

Question 25

Complete

Mark 1.00 out of 1.00

You are given two sorted singly linked lists. What is the best possible time complexity to merge them into one sorted linked list?

- a. O(log n + log m)
- b. O(n log n)
- c. $O(n^2)$
- d. O(n + m)