

Started on Tuesday, 18 March 2025, 3:18 PM**State** Finished**Completed on** Tuesday, 18 March 2025, 3:37 PM**Time taken** 19 mins**Marks** 14.50/30.00**Grade** 48.33 out of 100.00**Question 1**

Complete

Mark 1.00 out of 1.00

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In an AVL Tree, what is the range of the balance factor for each node?

- ☐ a. -2 to 2
- ☐ b. 0 to 2
- ☒ c. -1 to 1
- ☐ d. -3 to 3

Question 2

Complete

Mark 1.00 out of 1.00

 [Flag question](#)

What does the following code print?

```
Set<Integer> set = new HashSet<>(Arrays.asList(1, 2, 3, 2, 1));  
System.out.println(set.size());
```

- ☐ a. 5
- ☐ b. Compilation error
- ☒ c. 3
- ☐ d. 2

Question 3

Complete

Mark 1.00 out of 1.00

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?

Which of the following is true about Java constructors?

- ☒ a. Constructor can be private.
- ☐ b. Constructor can be static.
- ☒ c. Constructor must be public.
- ☐ d. Constructor can return a value.

Question 4

Complete

Mark 0.00 out of 1.00

🚩 [Flag question](#)

How many comparisons are required to insert 45 in the following BST?

```
      50
     /  \
    30   70
   /\  /\
  20 40 60 80
```

- ☐ a. 3
- ☐ b. 2
- ☒ c. 4
- ☐ d. 5

Question 5

Complete

Mark 1.00 out of 1.00

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What is the maximum height of a Red-Black Tree with n nodes?

- ☐ a. $O(n)$
- ☐ b. $O(n^2)$
- ☒ c. $O(\log n)$
- ☐ d. $O(1)$

Question 6

Complete

Mark 1.00 out of 1.00

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Consider two tables, Employees and Departments, with the following structures:

Employees:

employee_id (INT, PK), employee_name (VARCHAR), department_id (INT, FK), salary (DECIMAL)

Departments:

department_id (INT, PK), department_name (VARCHAR)

Which SQL query would return the names of all employees who earn a salary greater than the average salary of their respective department?

- ☐ a. `SELECT e.employee_name FROM Employees e WHERE e.salary > (SELECT AVG(salary) FROM Employees);`
- ☒ b. `SELECT e.employee_name FROM Employees e WHERE e.salary > AVG(e.salary) GROUP BY e.department_id;`
- ☒ c. `SELECT e.employee_name FROM Employees e WHERE e.salary > (SELECT AVG(salary) FROM Employees d WHERE d.department_id = e.department_id);`
- ☒ d. `SELECT e.employee_name FROM Employees e JOIN Departments d ON e.department_id = d.department_id WHERE e.salary > AVG(e.salary);`

Question 7

Complete

Mark 0.00 out of 1.00

 [Flag question](#)

Which of the following lambda expressions correctly sorts a list of integers in descending order?

- ☐ a. `(a, b) -> b - a`
- ☐ b. `(a, b) -> 0`
- ☒ c. `(a, b) -> a.compareTo(b)`
- ☐ d. `(a, b) -> a - b`

Question 8

Complete

Mark 0.00 out of 1.00

 [Flag question](#)

Which traversal method gives nodes in sorted order for a Binary Search Tree (BST)?

- ☐ a. Post-order
- ☒ b. Pre-order
- ☐ c. In-order
- ☐ d. Level-order

Question 9

Complete

Mark 1.00 out of 1.00

[Flag question](#)

Which lambda expression correctly sorts a list of Strings in reverse order?

- ☒ a. $(s1, s2) \rightarrow s2.compareTo(s1)$
- ☐ b. $(s1, s2) \rightarrow s1.length() - s2.length()$
- ☐ c. $(s1, s2) \rightarrow 0$
- ☐ d. $(s1, s2) \rightarrow s1.compareTo(s2)$

Question 10

Complete

Mark 1.00 out of 1.00

[Flag question](#)

Consider the following SQL query:

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

What happens if an employee does not have a matching department in the departments table?

- ☐ a. The employee is included but with a default department
- ☐ b. The employee is included in the result with a NULL department
- ☐ c. The query throws an error due to the missing department
- ☒ d. The employee is excluded from the result

Question 11

Complete

Mark 1.00 out of 1.00

[Flag question](#)

What will the following code print?

```
import java.util.function.Predicate;

public class Main {
    public static void main(String[] args) {
        Predicate<String> p = s -> s.length() > 5;
        System.out.println(p.test("HelloWorld"));
    }
}
```

- ☐ a. Compilation error
- ☐ b. false
- ☒ c. true
- ☐ d. Runtime error

Question 12

Complete

Mark 0.00 out of 1.00

[Flag question](#)

What will be the output of the following code?

```
import java.util.*;

public class Main {
    public static void main(String[] args) {
        Set<String> set = new HashSet<>();
        set.add("apple");
        set.add("banana");
        set.add("apple");
        System.out.println(set.size());
    }
}
```

- ☐ a. 2
- ☒ b. 3
- ☐ c. Compilation error
- ☐ d. 1

Question 13

Complete

Mark 0.00 out of 1.00

 [Flag question](#)

What will be the output of the following SQL query?

```
SELECT department, COUNT(*) AS emp_count  
FROM employees  
GROUP BY department  
HAVING COUNT(*) > 5;
```

- ☐ a. Returns departments where the total employee count is greater than 5
- ☒ b. Throws an error because HAVING cannot be used with COUNT(*)
- ☐ c. Returns all departments, regardless of employee count
- ☐ d. Groups by department but does not apply any filtering

Question 14

Complete

Mark 1.00 out of 1.00

 [Flag question](#)

How does a TreeMap store elements?

- ☐ a. Random Order
- ☒ b. Natural Order
- ☐ c. Hashing
- ☐ d. Insertion Order

Question 15

Complete

Mark 1.00 out of 1.00

 [Flag question](#)

Which of the following is true about a Trie data structure?

- ☒ a. Trie allows fast prefix-based search.

- ☐ b. Trie is a type of binary search tree.
- ☒ c. Trie supports only string data.
- ☐ d. Trie uses hash functions for indexing.

Question 16

Complete

Mark 1.00 out of 1.00

[Flag question](#)

What will be the output of the following query?

```
SELECT department, COUNT(*) AS num_employees
FROM employees
GROUP BY department
HAVING COUNT(*) > 5;
```

- ☒ a. Shows only departments where more than 5 employees work.
- ☐ b. Shows all departments and their employee count.
- ☐ c. Counts employees without filtering departments.
- ☐ d. Throws an error because HAVING must be used without GROUP BY.

Question 17

Complete

Mark 0.00 out of 1.00

[Flag question](#)

What will happen when null is inserted into a HashSet?

```
Set<String> set = new HashSet<>();
set.add(null);
System.out.println(set);
```

- ☐ a. Adds null successfully
- ☒ b. Throws NullPointerException
- ☐ c. Runtime error
- ☐ d. Compilation error

Question 18

Complete

Mark 1.00 out of 1.00

[Flag question](#)

What does this print?

```
import java.util.*;

public class Main {

    public static void main(String[] args) {
        List<Integer> list = Arrays.asList(1, 2, 3);
        list.forEach(n -> System.out.print(n * 2 + " "));
    }
}
```

- ☐ a. Compilation error
- ☐ b. 1 2 3
- ☒ c. 2 4 6
- ☐ d. 1 4 9

Question 19

Complete

Mark 0.00 out of 1.00

 [Flag question](#)

What will be the output?

```
class A {
    A() { System.out.print("A "); }
}
```

```
class B extends A {
    B() { System.out.print("B "); }
}
```

```
class C extends B {
    C() { System.out.print("C "); }
}
```

```
public class Main {
    public static void main(String[] args) {
        new C();
    }
}
```

- ☐ a. A C B
- ☐ b. Compilation error

- ☐ c. A B C
- ☒ d. C B A

Question 20

Complete

Mark 0.00 out of 1.00

[Flag question](#)

What happens if you use a mutable object as a key in a HashMap and later modify it?

- ☐ a. It behaves normally
- ☒ b. The map resizes automatically.
- ☐ c. It throws a ConcurrentModificationException.
- ☐ d. It may cause unexpected behavior when retrieving values.

Question 21

Complete

Mark 1.00 out of 1.00

[Flag question](#)

Which class represents a date without a time zone in Java 8?

- ☐ a. ZonedDateTime
- ☐ b. OffsetDateTime
- ☐ c. Instant
- ☒ d. LocalDate

Question 22

Complete

Mark 0.00 out of 1.00

[Flag question](#)

What will be printed?

```
class A {  
    A(int x) { System.out.println("A: " + x); }  
}
```

```
class B extends A {  
    B() {  
        super(10);  
        System.out.println("B");  
    }  
}  
  
public class Main {  
    public static void main(String[] args) {  
        new B();  
    }  
}
```

- ☒ a. B A: 10
- ☐ b. Runtime error
- ☐ c. Compilation error
- ☐ d. A: 10 B

Question 23

Complete

Mark 0.00 out of 1.00

[Flag question](#)

What will the following code print?

```
import java.util.*;  
import java.util.stream.*;  
public class Main {  
    public static void main(String[] args) {  
        List<String> list = Arrays.asList("apple", "banana", "cherry", "apple");  
        list.stream().filter(s -> s.length() > 5).distinct().forEach(System.out::println);  
    }  
}
```

- ☐ a. banana cherry
- ☒ b. banana cherry apple
- ☐ c. apple
- ☐ d. Compilation error

Question 24

Complete

Mark 0.00 out of 1.00

 [Flag question](#)

What will this code print?

```
import java.time.*;
import java.time.format.*;
public class Main {
    public static void main(String[] args) {
        LocalDate date = LocalDate.of(2025, 3, 13);
        DateTimeFormatter formatter = DateTimeFormatter.ofPattern("dd/MM/yyyy");
        System.out.println(date.format(formatter));
    }
}
```

- ☐ a. Compilation error
- ☐ b. 2025-03-13
- ☒ c. 03/13/2025
- ☐ d. 13/03/2025

Question 25

Complete

Mark 0.00 out of 1.00

 [Flag question](#)

What will be the output of the following SQL query?

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

- ☒ a. Syntax error due to _a%.
- ☐ b. Selects all employees whose names contain 'a' anywhere.
- ☐ c. Selects all employees whose second letter is 'a'.
- ☐ d. Selects all employees whose names start with 'a'.

Question 26

Complete

Mark 0.00 out of 1.00

 [Flag question](#)

Which statement is false about Hashtable in Java?

- ☐ a. Hashtable does not allow null keys.
- ☒ b. Hashtable has higher overhead compared to HashMap
- ☐ c. Hashtable is synchronized.
- ☐ d. Hashtable allows null keys and values.

Question 27

Complete

Mark 0.50 out of 1.00

🚩 [Flag question](#)

Which data structure does a HashMap use to resolve collisions when too many elements hash to the same bucket?

- ☐ a. Array
- ☐ b. LinkedList
- ☒ c. Red-Black Tree
- ☐ d. Binary Heap

Question 28

Complete

Mark 1.00 out of 1.00

🚩 [Flag question](#)

Which of the following queries finds the highest salary in each department?

- ☒ a.

```
SELECT department, salary
FROM employees
WHERE salary = MAX(salary) GROUP BY department;
```
- ☐ b.

```
SELECT department, MAX(salary) FROM employees;
```
- ☐ c.

```
SELECT department, salary
FROM employees
ORDER BY salary DESC;
```
- ☒ d.

```
SELECT department, MAX(salary)
FROM employees
GROUP BY department;
```

Question 29

Complete

Mark 0.00 out of 1.00

[Flag question](#)

How many nodes will be created when inserting the word "bat" into an empty trie?

- ☐ a. 3
- ☐ b. 1
- ☒ c. Depends on trie structure
- ☐ d. 4

Question 30

Complete

Mark 0.00 out of 1.00

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What is the height of a perfectly balanced binary search tree with 15 nodes?

- ☒ a. 4
- ☐ b. 3
- ☐ c. 6
- ☐ d. 5

[Finish review](#)