Question 1

Answer saved

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A hash table with a size of 10 uses linear probing to resolve collisions. If the hash function for a key k is h(k) = k mod 10, and the following keys are inserted in the order: 15, 25, 35, 12, 42. What will be the position of the key 42 in the hash table (assuming the table is 0-indexed)?

- [ ] a. 2
- [x] b. 4
- [ ] c. 3
- [ ] d. 5

Question 2

Answer saved

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Which is true? (Choose all that apply.)

- [x] a. "X extends Y" is correct if X and Y are either both classes or both interfaces
- [ ] b. "X extends Y" is correct if and only if X is an interface and Y is a class
- [ ] c. "X extends Y" is correct if and only if X is a class and Y is an interface
- [ ] d. "X extends Y" is correct for all combinations of X and Y being classes and/or interfaces

Question 3

Answer saved

Marked out of 1.00

Which of the following SQL statements is used to execute a stored procedure named CalculateOrderTotal that takes an input parameter @OrderID?

- [ ] a. RUN PROCEDURE CalculateOrderTotal(@OrderID);
- [x] b. CALL CalculateOrderTotal WITH @OrderID;
- [ ] c. SELECT CalculateOrderTotal(@OrderID);
- [ ] d. EXECUTE CalculateOrderTotal @OrderID;

Question 4

Answer saved

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What is the purpose of a Common Table Expression (CTE) in SQL, often used in more advanced queries or within stored procedures?

- [ ] a. To optimize data storage by eliminating redundancy.
- [x] b. To create a temporary table that exists only for the duration of a single query.
- [ ] c. To define a permanent view of the data.
- [ ] d. To enforce data integrity constraints.

Question 5

Answer saved

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Consider a singly linked list. If you are given a pointer to a node in the middle of the list (not the head or the tail), and you do not have access to the head of the list, how would you delete this node efficiently (in O(1) time)?

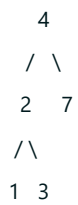
- [ ] a. This operation is not possible in $O(1)$ time without access to the head.
- [x] b. Swap the data of the given node with the data of the next node, and then delete the next node.
- [ ] c. Traverse from the beginning of the list to find the node before the given node and then update its next pointer.
- [ ] d. Set the data and next pointer of the given node to NULL.

Question 6

Answer saved

Marked out of 1.00

Consider the following binary tree:



What would be the order of nodes visited in a post-order traversal of this tree?

- [ ] a. 4, 7, 2, 3, 1
- [x] b. 1, 3, 2, 7, 4
- [ ] c. 4, 2, 1, 3, 7
- [ ] d. 1, 2, 3, 4, 7

Question 7

Answer saved

Marked out of 1.00

Given:

```
3. class Mammal {
4. String name = "furry ";
5. String makeNoise() { return "generic noise"; }
6. }
7. class Zebra extends Mammal {
8. String name = "stripes ";
9. String makeNoise() { return "bray"; }
10. }
11. public class ZooKeeper {
12. public static void main(String[] args) { new ZooKeeper().go(); }
13. void go() {
14. Mammal m = new Zebra();
15. System.out.println(m.name + m.makeNoise());
16. }
17. }
```

What is the result?

- [ ] a. stripes generic noise
- [ ] b. Compilation fails
- [ ] c. stripes bray
- [ ] d. An exception is thrown at runtime
- [ ] e. furry generic noise
- [x] f. furry bray

Question 8

Answer saved

Marked out of 1.00

Given:

```
1. enum Animals {
2. DOG("woof"), CAT("meow"), FISH("burble");
3. String sound;
4. Animals(String s) { sound = s; }
5. }
6. class TestEnum {
7. static Animals a;
8. public static void main(String [] args) {
9. System.out.println(a.DOG.sound + " " + a.FISH.sound);
10. }
11. }
```

What is the result?

- [ ] a. Compilation fails due to an error on line 9
- [x] b. woof burble
- [ ] c. Compilation fails due to an error on line 4
- [ ] d. Compilation fails due to an error on line 2
- [ ] e. Multiple compilation errors
- [ ] f. Compilation fails due to an error on line 3

Question 9

Answer saved

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Which of the following properties distinguishes a Binary Search Tree (BST) from a general binary tree?

- [ ] a. In a BST, all leaf nodes are at the same level.
- [x] b. In a BST, the left subtree of a node contains only nodes with keys less than the node's key, and the right subtree contains only nodes with keys greater than the node's key.
- [ ] c. A BST is always a balanced tree.
- [ ] d. A BST always has at most two children for each node.

Question 10

Answer saved

Marked out of 1.00

Given:

```
3. class Box {
4. int size;
5. Box(int s) { size = s; }
6. }
7. public class Laser {
8. public static void main(String[] args) {
9. Box b1 = new Box(5);
10. Box[] ba = go(b1, new Box(6));
11. ba[0] = b1;
12. for(Box b : ba) System.out.print(b.size + " ");
13. }
14. static Box[] go(Box b1, Box b2) {
15. b1.size = 4;
16. Box[] ma = {b2, b1};
17. return ma;
18. }
19. }
```

What is the result?

- [ ] a. 5 5
- [ ] b. Compilation fails
- [ ] c. 5 4
- [ ] d. 4 5
- [ ] e. 6 4
- [x] f. 4 4

Question 11

Answer saved

Marked out of 1.00

Consider the following stored procedure:

```
CREATE PROCEDURE UpdateProductPrice (
@ProductID INT,
@NewPrice DECIMAL(10, 2)
)
AS
BEGIN
UPDATE Products
SET Price = @NewPrice
WHERE ProductID = @ProductID;
END;
```

What is the primary purpose of the BEGIN and END keywords in this stored procedure?

- [x] a. To mark the beginning and end of the SQL statements within the procedure's body.
- [ ] b. To specify error handling blocks.
- [ ] c. To define the input parameters of the procedure.
- [ ] d. To indicate the start and finish of a transaction.

Question 12

Answer saved

Marked out of 1.00

Which of the following is an advantage of using stored procedures in a database system?

- [ ] a. Automatic schema updates.
- [ ] b. Increased client-side processing.
- [x] c. Reduced network traffic between the client and the database server.
- [ ] d. Direct manipulation of database files.

Question 13

Answer saved

Marked out of 1.00

Given:

```
3. class Building {
4. Building() { System.out.print("b "); }
5. Building(String name) {
6. this(); System.out.print("bn " + name);
7. }
8. }
9. public class House extends Building {
10. House() { System.out.print("h "); }
11. House(String name) {
12. this(); System.out.print("hn " + name);
13. }
14. public static void main(String[] args) { new House("x "); }
15. }
```

What is the result?

- [ ] a. bn x h hn x
- [ ] b. bn x b h hn x
- [x] c. b h hn x
- [ ] d. Compilation fails
- [ ] e. b bn x h hn x
- [ ] f. hn x h
- [ ] g. h hn x
- [ ] h. b hn x h

Question 14

Answer saved

Marked out of 1.00

Which SQL construct allows you to handle exceptions or errors that occur within a stored procedure?

- [ ] a. ERROR HANDLER
- [ ] b. WHEN ERROR
- [ ] c. ON EXCEPTION
- [x] d. TRY...CATCH

Question 15

Answer saved

Marked out of 1.00

You are implementing a queue using two stacks. Let's say stack1 is used for enqueue operations and stack2 is used for dequeue operations. Under what condition would you need to transfer elements from stack1 to stack2 during a dequeue operation?

- [ ] a. When stack1 is empty.
- [ ] b. When both stack1 and stack2 are non-empty.
- [x] c. When stack2 is empty.
- [ ] d. When stack2 is not empty.