

25 questions (25 pts) Question Bank: 27 Questions [?](#)**Test Introduction** (optional)[+ Add Introduction](#)**Question 1**

Generic Parent / Generic

1 pt

What is the result of this code?

```
1 #include <iostream>
2 using namespace std;
3
4 int count = 0;
5
6 int trickyRec(int n) {
7     if (n <= 0) return 1;
8     if (n % 2 == 0) count++;
9     return trickyRec(n - 1) + trickyRec(n - 2);
10 }
11
12 int main() {
13     cout << "Result: " << trickyRec(5) << endl;
14     cout << "Count: " << count << endl;
15     return 0;
16 }
17 }
```

A. Result: 15, Count: 8**B.** Result: 14, Count: 5**C.** Result: 11, Count: 6**D.** Result: 13, Count: 4

Question Type:	Multiple Choice
Randomize Answers:	Yes
Date Added:	Mon 5th May 2025
Last Modified:	N/A
QID#:	38,519,450

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Question 2

Generic Parent / Generic

1 pt

What will be the output of the program?

```
using System;

class Calculator
{
    public void Multiply(int a, int b)
    {
        Console.WriteLine("int, int");
    }

    public void Multiply(double a, double b)
    {
        Console.WriteLine("double, double");
    }
}

class Program {
    public static void Main ( string[] args ) {
        Calculator calc = new Calculator();
        calc.Multiply(5.0, 5.0);
    }
}
```

- A. double, double. Due to Method Overloading ✓
- B. int, int. Due to Method Overriding
- C. double, double. Due to Method Overriding
- D. Will not work due to same function names which will confuse the compiler

Question Type: Multiple Choice

Randomize Answers: Yes

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Question 3

Generic Parent / Generic

1 pt

You need to sort an array of integers where:

- The algorithm **must not exceed O(n log n)** time complexity in the **worst case**.
- **Memory efficiency is not a concern**, so using extra space is acceptable.
- Maintaining the relative order of equal elements (i.e., **stability**) is preferred.

A. Quick Sort**B.** Merge Sort**C.** Insertion Sort**D.** Bubble Sort

Question Type: Multiple Choice

Randomize Answers: Yes

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Generic Parent / Generic

1 pt

Imagine you have the following classes:

- **Animal** class with a method `speak()` that prints "Animal speaks".
- **Dog** class inherits from **Animal** and overrides the `speak()` method to print "Dog barks".

Now, you create an object of type **Dog** but refer to it as an **Animal** (e.g., `Animal pet = new Dog();`).

What will be the output when you call `pet.speak()` ?

A. Dog barks**B.** Animal speaks**C.** Compile-time error**D.** Runtime error

Question Type: Multiple Choice
Randomize Answers: Yes
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Question 5

Generic Parent / Generic

1 pt

Which one is the output of this program?

```
1 #include <iostream>
2 using namespace std;
3
4 void rotate(int arr[], int n) {
5     for (int i = 0; i < n - 1; i++) {
6         int temp = arr[i];
7         arr[i] = arr[i + 1];
8         arr[i + 1] = temp;
9     }
10 }
11
12 int main() {
13     int arr[] = {5, 2, 6, 5, 1};
14     rotate(arr, 5);
15     for (int i = 0; i < 5; i++) {
16         cout << arr[i] << " ";
17     }
18     return 0;
19 }
20 }
```

A. 5 2 6 5 1

B. 6 5 2 1 5

C. 2 6 5 1 5



D. 1 5 2 6 5

Question Type: Multiple Choice
Randomize Answers: Yes

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Question 6

Generic Parent / Generic

1 pt

What OOP principle is demonstrated by the ability of Dog and Cat to reuse the Eat() and Sleep() methods from Animal?

```
public class Animal
{
    public void Eat()
    {
        Console.WriteLine("This animal eats food.");
    }

    public void Sleep()
    {
        Console.WriteLine("This animal sleeps.");
    }
}

public class Dog : Animal
{
    public void Bark()
    {
        Console.WriteLine("The dog barks.");
    }
}

public class Cat : Animal
{
    public void Meow()
    {
        Console.WriteLine("The cat meows.");
    }
}
```

A. Polymorphism

B. Inheritance



C. Abstraction

D. Encapsulation

Question Type: Multiple Choice
Randomize Answers: Yes
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Question 7

Generic Parent / Generic

1 pt

You are tasked with sorting a large array of integers where:

- **Average-case performance should be fast.**
- **Extra memory usage should be minimal**, and the algorithm should work **in-place**.
- **Stability is not required**, and occasional worst-case slowdowns are acceptable.

A. Quick Sort 

B. Merge Sort

C. Insertion Sort

D. Bubble Sort

Question Type: Multiple Choice
Randomize Answers: Yes
Date Added: Mon 5th May 2025
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Question 8

Generic Parent / Generic

1 pt

Given the following **Students** table:

StudentID	Name	Age	Grade	Score	
1	Alice	20	A	90	
2	Bob	17	B	85	
3	Charlie	22	A	92	
4	David	19	C	78	
5	Eva	21	B	88	

Question:

Which SQL query will retrieve the **Name**, **Age**, and **Score** of students in **Grade B** or **C**, whose **Score** is greater than **80**, sorted by **Score** in descending order?

- A.** SELECT Name, Age, Score FROM Students WHERE (Grade = 'B' OR Grade = 'C') AND Score > 80 ORDER BY Score DESC;
- B.** SELECT Name, Age, Score FROM Students WHERE Grade = 'B' AND Score > 80 ORDER BY Age DESC;
- C.** SELECT Name, Age, Score FROM Students WHERE Grade IN ('B', 'C') AND Score > 80 ORDER BY Score ASC;
- D.** SELECT Name, Age, Score FROM Students WHERE Grade = 'C' AND Score > 80 ORDER BY Name;

Question Type: Multiple Choice

Randomize Answers: Yes

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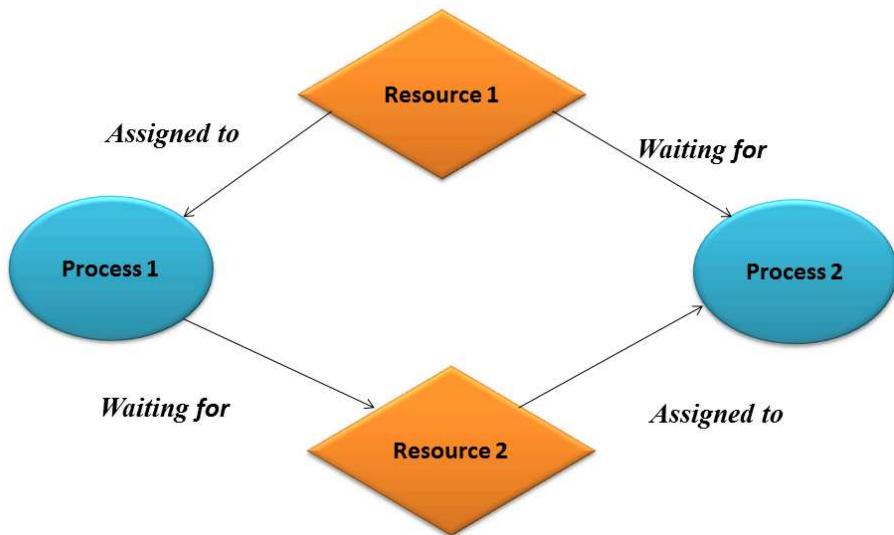
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Question 9

Generic Parent / Generic

1 pt

The below scenario is called



- A. Multithreading
- B. Semaphore
- C. Deadlock
- D. Parallel Processing



Question Type: Multiple Choice
Randomize Answers: Yes
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QID#: 38,519,918

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Question 10

Generic Parent / Generic

1 pt

Which query will display **student names** along with their **course names**?

You are given the following two tables:

Students Table:

StudentID	Name
1	Alice
2	Bob
3	Charlie

Courses Table:

CourseID	StudentID	CourseName
101	1	Math
102	2	Physics
103	1	Chemistry

- A. SELECT Name, CourseName FROM Students JOIN Courses ON Students.StudentID = Courses.StudentID; ✓
- B. SELECT Name, CourseName FROM Students, Courses;
- C. SELECT Name, CourseName FROM Students WHERE Students.StudentID = Courses.StudentID;
- D. SELECT * FROM Students JOIN Courses ON Name = CourseName;

Question Type: Multiple Choice
 Randomize Answers: Yes
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Answers Edit Duplicate Used In Reorder

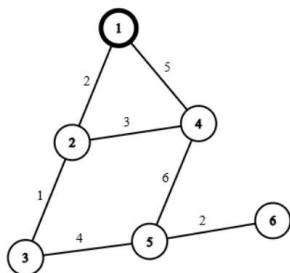
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Question 11

Generic Parent / Generic

1 pt

You are given the following weighted undirected graph represented as a list of edges:



Suppose Dijkstra's Algorithm is applied starting from node 1. The algorithm always selects the next unvisited node with the smallest known distance from the start node. Which of the following shows the correct order in which the nodes are processed (finalized) by Dijkstra's Algorithm?

A. 1 → 2 → 4 → 3 → 5 → 6

B. 1 → 2 → 3 → 4 → 5 → 6



C. 1 → 4 → 2 → 3 → 5 → 6

D. 1 → 3 → 2 → 4 → 5 → 6

Question Type: Multiple Choice

Randomize Answers: Yes

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Question 12

Generic Parent / Generic

1 pt

What is the output of this program?

```

1 #include <iostream>
2 #include <string>
3 using namespace std;
4
5 int main() {
6     string s = "abcde";
7     for (int i = 0; i < s.length() / 2; i++) {
8         char temp = s[i];
9         s[i] = s[s.length() - 1 - i];
10        s[s.length() - 1 - i] = temp;
11    }
12    cout << s << endl;
13    return 0;
14 }
15

```

A. abcde**B.** bcdea**C.** eabcd**D.** edcba

Question Type: Multiple Choice
 Randomize Answers: Yes
 Date Added: Mon 5th May 2025
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 QID#: 38,520,091

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Question 13

[Generic Parent / Generic](#)

1 pt

Given the following **Students** table:

ID	Name	Age	Grade	
1	Alice	20	A	
2	Bob	17	B	
3	Charlie	22	A	
4	David	19	C	
5	Eva	21	B	

Which SQL query would retrieve the Name and Age of all students older than 18?

- A. SELECT Name, Age FROM Students WHERE Age > 18;
- B. SELECT Name, Age FROM Students WHERE Age ⇒ 18;
- C. SELECT * FROM Students WHERE Age > 18;
- D. SELECT Name, Age FROM Students WHERE Grade = 'A';



Question Type: Multiple Choice
Randomize Answers: Yes
Date Added: Mon 5th May 2025
Last Modified: N/A
QID#: 38,520,203

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Question 14

Generic Parent / Generic

1 pt

Which of the following best explains the difference between Method Overloading and Method Overriding?

- A. Overloading happens at compile time while overriding happens at runtime.
- B. Overloading happens at Runtime; Overriding Happens at compile time
- C. Overloading is only used in simple programs; Overriding is used in complex ones
- D. Overloading and Overriding mean the same thing but are used in different places



Question Type: Multiple Choice
Randomize Answers: Yes
Date Added: Mon 5th May 2025
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QID#: 38,520,212

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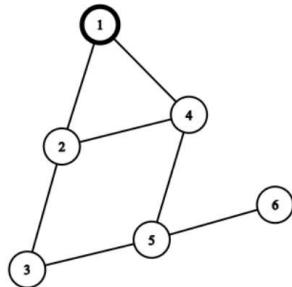
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Question 15

Generic Parent / Generic

1 pt

You are given the following undirected graph represented by edges:



Assume the graph is unweighted and represented using an adjacency list, and Breadth-First Search (BFS) is applied starting from node 1. BFS explores neighbors in the order they appear in the adjacency list and visits nodes level by level. Which of the following sequences shows the correct order in which the nodes are visited during BFS traversal from node 1?

A. 1 → 2 → 4 → 3 → 5 → 6



B. 1 → 4 → 3 → 2 → 5 → 6

C. 1 → 2 → 3 → 5 → 4 → 6

D. 1 → 4 → 2 → 6 → 3 → 5

Question Type: Multiple Choice

Randomize Answers: Yes

Date Added: Mon 5th May 2025

Last Modified: N/A

QID#: 38,520,221

Answers

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Question 16

Generic Parent / Generic

1 pt

In database systems, transactions ensure the correct execution of operations even in the presence of failures such as power outages or system crashes. A transaction must satisfy a set of properties commonly referred to as ACID properties.

Which of the following best describes the purpose of these ACID properties in a database transaction system?

A. To improve the visual layout of data tables for better user interface design

- B. To guarantee that data remains consistent, isolated, and durable, and that all-or-nothing execution is ensured ✓
- C. To allow multiple users to access the database simultaneously without any restrictions
- D. To make database backups more efficient by compressing data during transactions

Question Type: Multiple Choice
Randomize Answers: Yes
Date Added: Mon 5th May 2025
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QID#: 38,520,286

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Question 17

Generic Parent / Generic

1 pt

What is the constant factor of this code's Time Complexity?

```
for (int i = 1; i <= n; i++) {  
    for (int j = i; j <= n; j++) {  
        for (int k = 1; k <= 100; k++) {  
            cnt++;  
        }  
    }  
}
```

A. 100

B. 0.5

C. 50 ✓

D. 1

Question Type: Multiple Choice
Randomize Answers: Yes
Date Added: Mon 5th May 2025
Last Modified: N/A
QID#: 38,520,300

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1 pt

Question 18

Generic Parent / Generic

You are tasked with configuring a new network that requires a much larger pool of available IP addresses, along with support for features such as improved security, more efficient routing, and better support for mobile devices. Which IP version should be used for this network?

- A. IPv4
- B. IPv5
- C. IPv6
- D. DNS



Question Type: Multiple Choice
Randomize Answers: Yes
Date Added: Mon 5th May 2025
Last Modified: N/A
QID#: 38,520,309

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1 pt

Question 19

Generic Parent / Generic

Consider a relational database where a table contains employee information, including employee ID, name, department ID, and department name. Suppose this table stores multiple entries for each department because many employees belong to the same department, resulting in repetition of department information.

Which database design issue does this scenario best illustrate, and which concept is commonly applied to address this issue?

- A. Data security violation; resolved by adding indexes
- B. Data integrity loss; resolved using stored procedures
- C. Data redundancy; resolved through normalization
- D. Data inconsistency; resolved using triggers



Question Type: Multiple Choice
Randomize Answers: Yes
Date Added: Mon 5th May 2025
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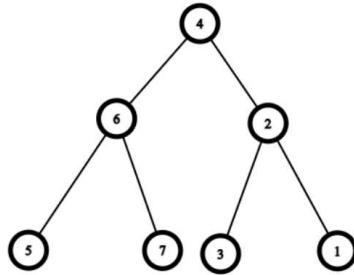
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Generic Parent / Generic

1 pt

Question 20

Consider the binary tree shown below:



What is the in-order traversal of this binary tree?

- A. 5 6 7 4 3 2 1 ✓
- B. 1 2 3 4 7 6 5
- C. 5 7 6 4 1 2 3
- D. 3 2 1 4 5 6 7

Question Type: Multiple Choice
Randomize Answers: Yes
Date Added: Mon 5th May 2025
Last Modified: N/A
QID#: 38,520,701

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Generic Parent / Generic

1 pt

Question 21

You're given a **0/1 Knapsack problem** where the maximum capacity of the knapsack is $W = 10$.

You have the following **5 items**, each with a weight and value:

Item	Weight	Value
1	3	4
2	4	5
3	5	7
4	2	3
5	1	2

You can either **include** or **exclude** each item (you can't take fractions).

What is the **maximum value** you can carry in the knapsack?

A. 12

B. 14



C. 13

D. 15

Question Type: Multiple Choice

Randomize Answers: Yes

Date Added: Mon 5th May 2025

Last Modified: N/A

QID#: 38,520,706

Answers

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Question 22

Generic Parent / Generic

1 pt

You are developing an online banking application, and you need to ensure that all data exchanged between the client and the server (such as account numbers, transactions, and passwords) is secure and encrypted.

Which protocol should you use to ensure that the data is encrypted during transmission?

A. HTTP

B. FTP

C. HTTPS



D. SMTP

Question Type: Multiple Choice
Randomize Answers: Yes
Date Added: Mon 5th May 2025
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QID#: 38,520,718

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Question 23

Generic Parent / Generic

1 pt

Which of the following statements correctly describes the key difference between a thread and a process in the context of operating systems?

Options:

- A)** A thread is the smallest unit of execution within a process, while a process is an independent unit of execution that does not share resources with other processes.
- B)** A process is the smallest unit of execution, and threads are independent and have their own memory space.
- C)** Threads within the same process share the same memory space, while processes have separate memory spaces and are isolated from each other.
- D)** Threads and processes both have their own independent memory space and do not share resources.

A. A

B. B

C. C



D. D

Question Type: Multiple Choice
Randomize Answers: Yes
Date Added: Mon 5th May 2025
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QID#: 38,520,737

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[Remove From Test](#)**Question 24**

Generic Parent / Generic

1 pt

```
for (int i = 1; i <= n; i *= 2) {
    for (int j = 1; j <= i; j++) {
        cnt++;
    }
}
```

A. $O(\log(n))$ **B.** $O(n)$ **C.** $O(n^2)$ **D.** $O(2^n)$

Question Type: Multiple Choice
 Randomize Answers: Yes
 Date Added: Mon 5th May 2025
 Last Modified: N/A
 QID#: 38,520,744

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[Remove From Test](#)**Question 25**

Generic Parent / Generic

1 pt

You are working with a singly linked list, where each node has two fields: data and a pointer to the next node. Which of the following operations is **not** a constant-time operation (i.e., requires more than $O(1)$ time complexity) when performed on this linked list?

- A)** Accessing the first element of the list
- B)** Adding a new node at the end of the list (without a tail pointer)
- C)** Deleting the first node of the list
- D)** Traversing the entire list to print all elements

A. A

B. B**C.** C**D.** D

Question Type: Multiple Choice
Randomize Answers: Yes
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