Web Full stack Admission test Sample (F)
Name :

Section One Programming Basics

```cpp
#include <iostream>
using namespace std;

void func(int arr[], int n) {
    for (int i = 0; i < n; i++) {
        arr[i] += 2;
    }
}

int main() {
    int arr[3] = {1, 2, 3};
    func(arr, 3);
    for (int i = 0; i < 3; i++) {
        cout << arr[i] << " ";
    }
    return 0;
}
```

Answer :

```cpp
#include <iostream>
using namespace std;

void swap(int &x, int &y) {
    int temp = x;
    x = y;
    y = temp;
}

int main() {
    int a = 5, b = 10;
    swap(a, b);
    cout << a << " " << b;
    return 0;
}
```

Answer :

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```cpp
#include <iostream>
using namespace std;

void incrementArray(int arr[], int n) {
    for (int i = 0; i < n; i++) {
        arr[i]++;
    }
}

int main() {
    int arr[3] = {1, 2, 3};
    incrementArray(arr, 3);
    for (int i = 0; i < 3; i++) {
        cout << arr[i] << " ";
    }
    return 0;
}
```

Answer :

```cpp
#include <iostream>
using namespace std;

int fibonacci(int n) {
    if (n <= 1) return n;
    return fibonacci(n - 1) + fibonacci(n - 2);
}

int main() {
    cout << fibonacci(5);
    return 0;
}
```

Answer :

```cpp
#include <iostream>
using namespace std;

int fibonacci(int n) {
    if (n <= 1) return n;
    return fibonacci(n - 1) + fibonacci(n - 2);
}

int main() {
    cout << fibonacci(5);
    return 0;
}
```

Answer :

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Section Two OOP

1. **Which of the following best describes the concept of polymorphism in Java?**
    a) A class can have multiple constructors
    b) A subclass can override methods of its superclass
    c) The ability of different classes to be treated as instances of the same class through inheritance
    d) Encapsulation of data members within a class.
2. **What is the primary advantage of using inheritance in Java?**
    a) Code redundancy
    b) Improved performance
    c) Code reusability
    d) Better data encapsulation
3. **Which of the following statements about abstract classes and interfaces is true?**
    a) An abstract class can implement methods but cannot declare variables
    b) An interface can have method implementations
    c) A class can extend multiple abstract classes
    d) An abstract class can have both abstract and non-abstract methods
4. **Which of the following is true about exception handling in Java?**
    a) All exceptions are checked exceptions
    b) The finally block is optional and will execute only if no exception is thrown
    c) An exception can be rethrown in a catch block
    d) A method that throws a checked exception does not need to declare it using the throws keyword
5. **What is the purpose of the throws keyword in Java?**
    a) To handle exceptions
    b) To declare exceptions that can be thrown by a method
    c) To create a new exception
    d) To terminate the program

section Three Database and analysis

DriveEase Rentals is a new car rental store that needs a comprehensive database system to manage their operations effectively. The database must keep track of cars, customers, rentals, and transactions. Below are the key requirements and scenarios for the database system:

Your Task:

As a database analyst, you are tasked with designing a database system for the DriveEase Rentals app. Based on the scenario described, answer the following questions:

1- List the primary entities that would be part of the database system for the library management system.

2- Draw an Entity-Relationship Diagram (ERD) that represents the entities and relationships identified in question 1. Clearly indicate primary keys and foreign keys.

3- Write SQL queries for the following operations:
   a. Insert a new car into the system.
   b. Retrieve all available cars.
   c. Rent a car to a customer.
   d. Return a rented car.

Section Four Web front end

Using the provided screenshot, your task is to replicate the home web page using HTML and CSS. Ensure that the design is responsive and visually matches the screenshot provided.

Requirements

1- Use semantic HTML5 elements where appropriate.
2- Ensure the layout is responsive and adjusts gracefully to different screen sizes.
3- Style the page using CSS to match the visual design of the screenshot.

Note:

It is not required to clone the screenshot exactly, but aim to create something as close as possible to the given design.

Deliverables:

- A complete HTML file with the structure of the web page.
- A CSS file with all the styles applied to replicate the design in the screenshot.