

Part A: Conceptual Questions

1. Definition of a Class and an Object

What is a class in object-oriented programming?

A class is the blueprint for creating objects. In a class the programmer will add attributes and methods to define what the class does.

What is an object, and how does it relate to a class?

An object is the instance of a class. An object is created with the attributes and methods defined in the class.

2. Constructors and Destructors

Define a constructor. What is its role in a class?

A constructor is a method that is called when an object is created. It is used to initialize the object's properties and set up anything else that is necessary,

Define a destructor. Why is it important in managing an object's lifecycle?

A destructor is a method that is called when an object is destroyed. A destructor releases resources like memory. It is important because it makes sure that no memory is being wasted, which improves performance.

3. Object Lifecycle

Briefly describe the lifecycle of an object from instantiation to destruction.

During instantiation the object is created with a constructor, memory is allocated for the object, and initial values are assigned. During the active stage when the object is being

used the object will do whatever it is supposed to using methods. Then in destruction the memory is deallocated, and the object no longer exists.

Why is it important for a class to manage its resources (e.g., memory) during its lifecycle?

It is important to manage resources because it prevents memory leaks which could lead to a program slowing down or crashing. It ensures that resources are properly closed when not needed. It improves performance and prevents dangling pointers.