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***Design Patterns and Principles Quiz Answers***

 **What is a design pattern in software development?**

* **B) A general reusable solution to a commonly occurring problem**

 **How many types of design patterns are there?**

* **B) 5** (Creational, Structural, Behavioral, Concurrency, and Architectural)

 **What is the main benefit of using a design pattern?**

* **D) All of the above** (It reduces the total codebase, allows for separation of responsibilities, and ensures that the code is easier to understand and debug)

 **Which of the following is NOT a creational design pattern?**

* **C) Bridge Pattern**

 **Which of the following is a behavioral design pattern?**

* **A) Observer Pattern**

 **What is a Singleton design pattern?**

* **A) A design pattern that allows you to ensure that a class has only one instance**

 **Which of the following best describes the Factory Pattern in design patterns?**

* **D) It allows an object to be created without exposing the creation logic to the client and the created object is referred to using a common interface.**

 **What is the use of the Builder Pattern?**

* **A) It simplifies the creation of complex objects by breaking the creation process into steps.**

 **What is the primary purpose of the Abstract Factory design pattern in software design?**

* **A) It provides an interface for creating families of related or dependent objects without specifying their concrete classes.**

 **What is the primary purpose of the Prototype Pattern in design patterns?**

* **B) To create a clone of an existing object rather than creating a new one, typically for performance reasons.**

 **What is the primary function of the Adapter design pattern in software development?**

* **A) It allows classes with incompatible interfaces to work together by wrapping its own interface around that of an already existing class.**

 **Which pattern helps in reducing complex conditional logic?**

* **A) Strategy pattern**

 **The Decorator design pattern is also known as:**

* **A) Wrapper**

 **Which structural pattern should be used when you want to add responsibilities to an object dynamically?**

* **C) Decorator**

 **Which of the following best describes the Composite design pattern?**

* **A) The Composite pattern composes objects into tree structures to represent part-whole hierarchies.**

 **Which design pattern provides a way to access the elements of an aggregate object sequentially without exposing its underlying representation?**

* **C) Iterator pattern**

 **Which pattern is specifically concerned with communication between objects?**

* **A) Mediator**

 **In which pattern does a surrogate or placeholder class control access to the original object?**

* **B) Proxy**

 **Which structural design pattern decouples an abstraction from its implementation so that the two can vary independently?**

* **B) Bridge**

 **Which pattern allows an object to change its behavior when its internal state changes?**

* **A) State**

 **Which behavioral design pattern should be used when a behavior among objects should be encapsulated and made to operate on an object structure?**

* **A) Visitor**

 **Which behavioral design pattern defines a family of algorithms, encapsulates each one, and makes them interchangeable?**

* **A) Strategy**

 **Which design pattern is used when there is a one-to-many dependency between objects so that when one object changes state, all its dependents are notified and updated automatically?**

* **A) Observer**

 **Which design pattern would you use to encapsulate a request as an object?**

* **B) Command Pattern**

 **What is Template Design Pattern?**

* **A) It defines the skeleton of an algorithm in a method, deferring some steps to subclasses.**