

**Question 01.**

- a) Which design pattern restricts the instantiation of a class to one object and provides a global point of access to it? Write a code example. [8 Marks]
- b) Explain the **Thread-safe** behavior of the above pattern. [4 Marks]

**Question 02.**

- a) Which design pattern works as a bridge between two incompatible interfaces? [1 Marks]
- b) Write a code example for the above pattern. [9 Marks]
- c) Draw a class diagram for the above pattern. [4 Marks]

**Question 03.**

- a) What is **RMI**? [2 Marks]
- b) What is the design pattern used in **RMI**? [1 Marks]
- c) What is the **Stub object** according to the design pattern? [2 Marks]
- d) Write code examples to the followings,
  - I. Create a **Remote interface** with the method **String view()**; [4 Marks]
  - II. Create a **Server** class to register the service. [6 Marks]
  - III. Create a **Client** class to lookup the service and call the remote method **view()**; then print the output. [5 Mark]

**Question 04.**

- a) What is **Template Method** Pattern? [2 Marks]
- b) Write a code example to demonstrate the **Template Method** Pattern. [8 Marks]
- c) Explain the **hook()**; method using your code example. [4 Marks]

**Question 05.**

- a) Which design pattern is used to provide a standard way to traverse through any collections without exposing its internal structure? [1 Marks]
- b) Write a code example to demonstrate the above pattern. [10 Marks]
- c) Explain the two main tasks in this pattern. [3 Marks]

**Question 06.**

- a) Explain the **State Design** Pattern? [3 Marks]
- b) Write a code example to demonstrate the **State Pattern**. [9 Marks]

• **ANSWERS ONE OUT OF THE FOLLOWING QUESTIONS.**

**Question 07.**

- a) Which design pattern maintains a list of dependents and notifies them automatically of any state changes? [1 Marks]
- b) Write a code example to demonstrate the above pattern. [10 Marks]
- c) Draw a class diagram for the above. [3 Marks]

**Question 08.**

- a) Write a code example to demonstrate Decorator Pattern. [10 Marks]
- b) Draw a class diagram to the Decorator Pattern. [4 Marks]