[CRT03]

UNIVERSITY OF BOLTON

SCHOOL OF CREATIVE TECHNOLOGIES

MSC SOFTWARE ENGINEERING/AI

SEMESTER TWO EXAMINATIONS 2023/2024

ADVANCED SOFTWARE DEVELOPMENT

MODULE NO: SWE7102

Date: Tuesday 14th May 2024 **Time: 14:00 – 16:00**

INSTRUCTIONS TO CANDIDATES:

There are FIVE questions in this paper.

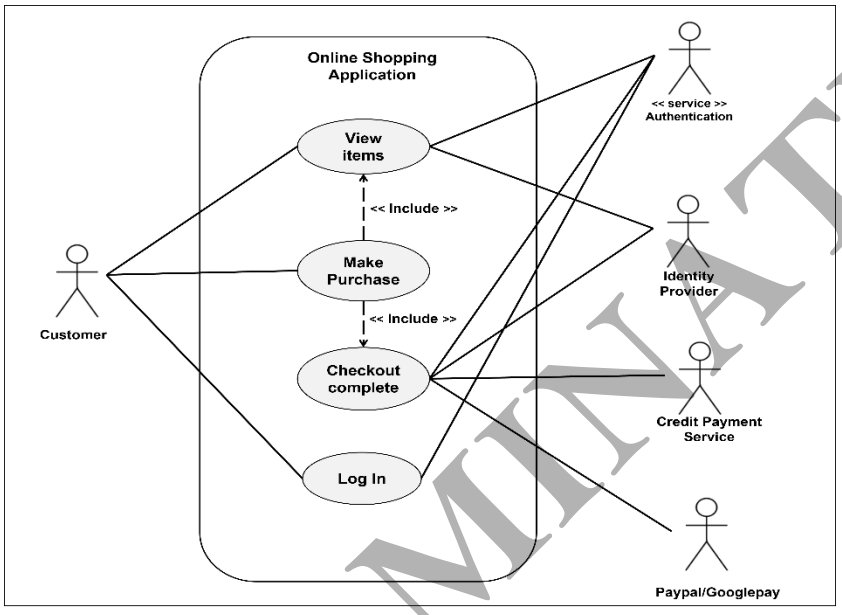
Answer ANY FOUR questions.

Total Marks: 40

School of Creative Technologies
MSc Software Engineering/AI
Semester Two Examinations 2023/2024
Advanced Software Development
Module No. SWE7102

Question 1

Examine the provided UML diagram to explain its representation and rationale behind its constituent elements. Provide a detailed analysis and justification for each component depicted within the diagram.



[10 marks]

Question 2

Develop and code a Java application to compute the area of a rectangle. This will be achieved by constructing a class named 'Area'. The class will take in the length and breadth of the rectangle as parameters obtained from user input via the keyboard during initialization. Additionally, implement a method called 'getArea' within the class to perform the computation and return the result. Conduct a thorough analysis of the data structures, algorithms, and design patterns utilized in the implementation. Furthermore, evaluate the efficiency and scalability of the solution to assess its performance across varying scenarios.

[10 marks]

- **PLEASE TURN THE PAGE….**

School of Creative Technologies
MSc Software Engineering/AI
Semester Two Examinations 2023/2024
Advanced Software Development
Module No. SWE7102

Question 3

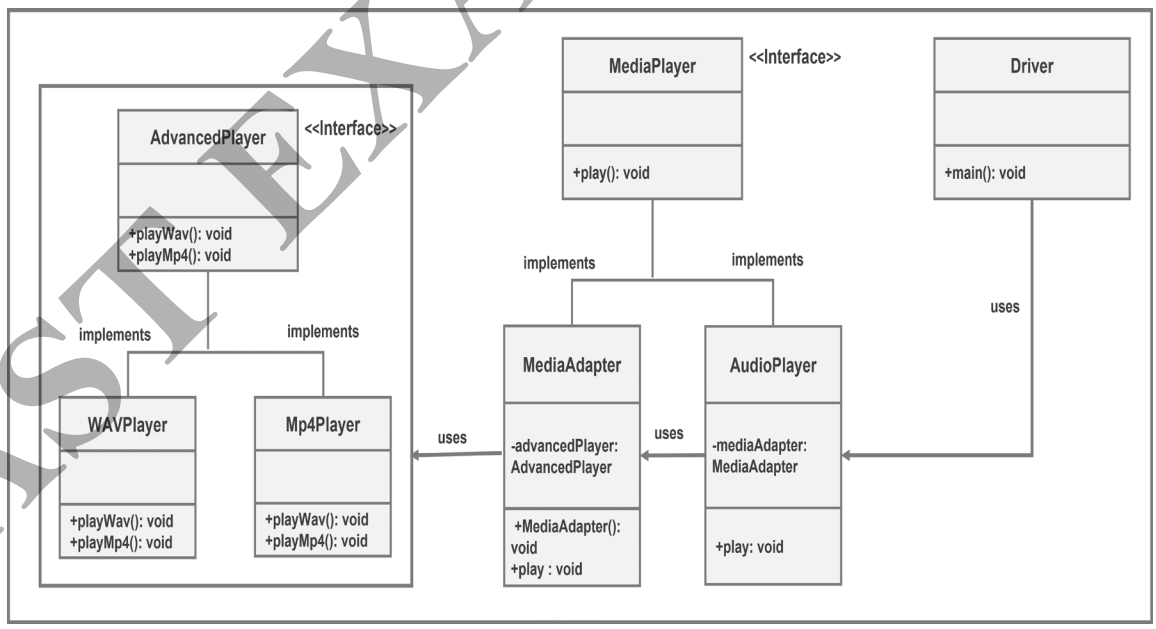
Review the provided code snippet to determine the design pattern it exemplifies. Identify the pattern's classification (creational, structural, or behavioural) and assess its distinguishing characteristics.

```
public class Student {

        private static Student instance = new Student ();
        private Student(){}

        public static Student getInstance(){
                return instance;
                }

        public void showMessage () {
                System.out.println("Hello World!");
                }
}
```

[10 marks]

Question 4

Assess the given UML diagram by pinpointing the design pattern it employs, and provide a detailed explanation of its application in the context of the specified system.



[10 marks]

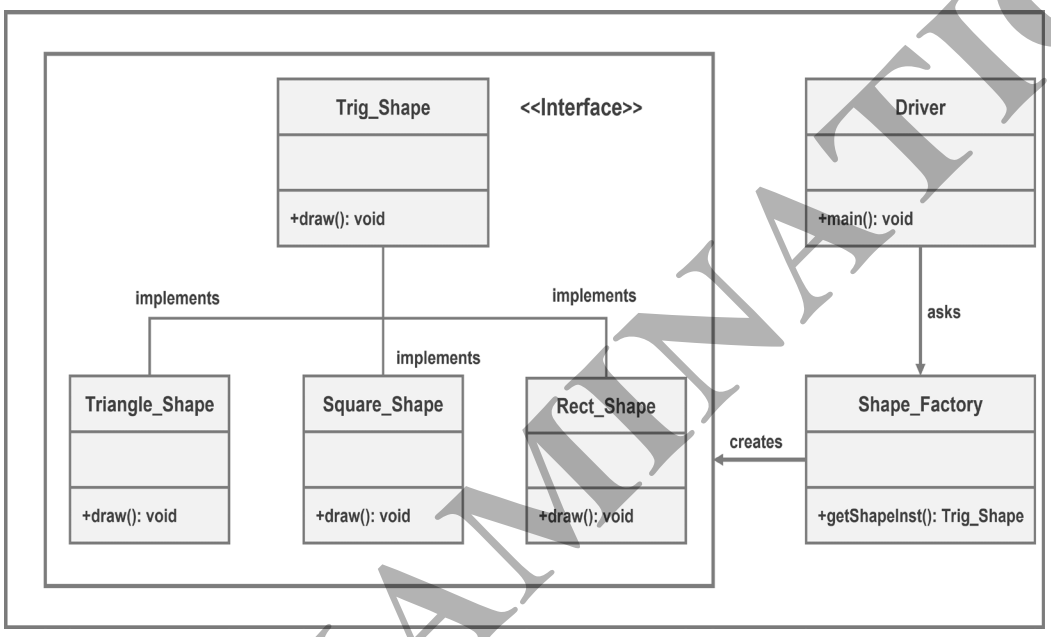
- **PLEASE TURN THE PAGE….**

School of Creative Technologies
MSc Software Engineering/AI
Semester Two Examinations 2023/2024
Advanced Software Development
Module No. SWE7102

Question 5

Analyse the given UML diagram with the following objectives:

a) Assess the design pattern depicted by the UML diagram.
b) Develop a comprehensive Java implementation for the components depicted in the UML diagram, ensuring that the code adheres to the principles and structure of the identified design pattern.



[5+5 marks]

END OF QUESTIONS