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M S RAMAIAH INSTITUTE OF TECHNOLOGY

(AUTONOMOUS INSTITUTE, AFFILIATED TO VTU)

BANGALORE – 560 054

SEMESTER END EXAMINATIONS – JANUARY 2015

Course & Branch	:	**B.E. – INFORMATION SCIENCE & ENGG.**	**Semester**	:	**VII**
Subject	:	**Software Design Patterns**	**Max. Marks**	:	**100**
Subject Code	:	**IS705**	**Duration**	:	**3 Hrs**

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1. a) With a suitable example explain how UML diagrams can be used in different phases of software development. (10)
   b) "Traditional object oriented design has its limitations" - Discuss with an example. (10)

2 a) What are the three fundamental reasons to use UML? Describe different types of relations with neat diagrams. (10)
   b) "Object Oriented system should have high cohesion and low coupling" - Write the debating points on the same. (10)

UNIT – II

3. a) Explain the Strategy pattern with its key features and neat diagram (10)
   b) Consider the following code - (10)

```
class Editor{
virtual void show() { }; };

class MainText:public Editor{
void show() { cout<<"hi!"; } };

class SimpleHeader:public Editor{
void show() { cout<<"title"; } };

class SimpleFooter{
void display() { cout<<"page number";} };
```

Demonstrate how SimpleFooter can be adapted into Editor family.

4. a) Explain the Facade pattern with its key features and neat diagram (10)
   b) How Bridge pattern can be used in the design of a visual text editor with menus and scroll bar. (10)

UNIT – III

5. a) Refer the classes Editor, MainText and SimpleHeader from 3b. Consider the following new classes (10)

```
class FancyHeader{
void show() { cout<<"author name"; } };

class FancyFooter{
void show() { cout<<"institute name";} };
```

Demonstrate how Decorator pattern can be used to create various combinations of headers and footers for MainText.

b) Briefly discuss the five possible errors in using software design patterns. (10)

6. a) Explain the Abstract Factory pattern with its key features and neat diagram (10)
b) Illustrate how Commonality and Variability Analysis can be used to design a better object oriented system. (10)

UNIT – IV

7. a) Demonstrate how Template and Factory Method patterns can be used together. (10)
b) Under what conditions should an Observer pattern not be used? Explain with an example. (10)

8. a) All students of ISE department have subscribed to a common group-mail called "ISE". Within this there are subgroups like "Year2" , "Year3" and "Year4". Each Year is further sub-grouped into "SecA" "SecB" and "SecC". Design this system using Observer pattern and show how -
i. A student of Year3 SecB can send message to only his classmates
ii. An office staff can send a notice to all students of ISE. (10)

b) Explain the Singleton pattern with its key features and neat diagram. (10)

UNIT – V

9. a) Describe the Architecture Business Cycle with a neat diagram. (10)
b) Comment on the role of Software Design Patterns in building a Software Architecture. (10)

10. a) Explain any five structural guidelines to be followed in order to create a good design. (10)
b) Illustrate the three main architectural structures with suitable examples. (10)

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