Course Code : CST 316 **CXDW/RW – 18 / 5057**

Fifth Semester B. E. (Computer Science and Engineering) Examination

DESIGN PATTERNS

Time : 3 Hours] [Max. Marks : 60

Instructions to Candidates :—

Due credit will be given to neatness.

1. Question (a) is compulsory. Solve b) or c)

   (a) Many design patterns make use of object composition over class inheritance. Explain why. Also elaborate advantages and disadvantages of using composition over inheritance. 5 (CO 1)

   (b) What is a design pattern ? Explain the classification of design pattern on the basis of both purpose and scope. 5 (CO 1)

   (c) List and explain the characteristics of design pattern. 5 (CO 1)

2. (a) With a Motivation, explain Intent, Structure and Participants for Abstract factory design Pattern. 5 (CO 2)

   (b) A sales analysis on a set of Employee data and Student data from a database is to be done. Normally, we would copy the information from the database, encapsulate it into an object and do the analysis. But if another analysis is needed on the same set of data, reading the database again and creating a new object is not the best idea. Which design pattern must be used for the other analysis ? Implement Java program using the same. 5 (CO 2)

3. Solve any **Two** :—

   (a) Answer :

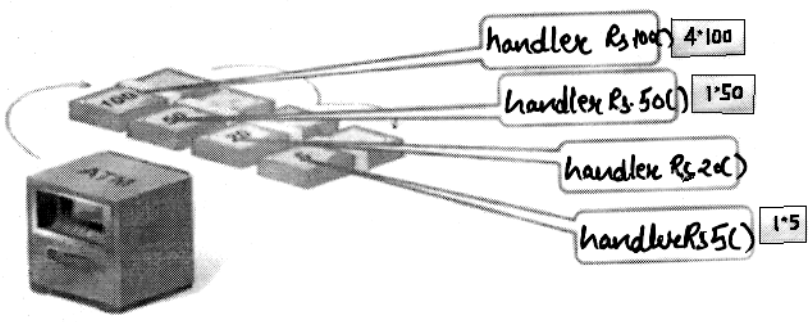
      (i) What are the different issues to be considered when applying Decorator Pattern ? 3 (CO 2)

      (ii) Why Strategy pattern is related pattern to Decorator Pattern ? 2 (CO 2)

(b) *Equipment* class defines an interface for 3 equipments in the part-whole hierarchy using *Name ()* and *NetPrice ()* methods. *CompositeEquipment* is the base class for equipment that contains other equipments. Implement a java program using Composite design pattern to print payment statement where client must be able to buy any single equipment or composite equipment. 5 (CO 2)

(c) With reference to structure and consequences differentiate class Adapter and object Adapter design patterns. 5 (CO 2)

4. (a)



Analyze the picture given above. An ATM machine uses chain of responsibility design pattern to handle cash withdrawals such that if Rs. 455 is to be withdrawn as shown above client will receive four 100 Rs notes, one 50 Rs note and one 5 Rs note. Implement a Java program for this application. 5 (CO 3)

(b) Illustrate the use of Interpreter design pattern to handle the language grammar. 5 (CO 3)

5. (a) Which behavioral design pattern will be best suitable for following applications:

(i) Online bidding

(ii) Air Traffic Controller

(iii) Restore the state of game player to successfully crossed level. 3 (CO 3)

(b) Give the other names for following design patterns

(i) Strategy

(ii) State

(iii) Observer 3 (CO 3)

(c) Explain intent, structure, participants and collaborations of State design pattern. 4 (CO 3)

6. (a) Explain different problems to be handled in Lexi WYSIWYG editor design. 5 (CO 4)

(b) How multiple Look-and-Feel standards are supported in product design? 5 (CO 4)