CBCS SCHEME

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15IS72

Seventh Semester B.E. Degree Examination, July/August 2022
Software Architecture and Design Patterns

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. What is and is not a design pattern? **(06 Marks)**

b. How design patterns solve design patterns? **(10 Marks)**

OR

2 a. Describe step-by-step approach of applying a design pattern effectively. **(04 Marks)**

b. Briefly explain the key concepts of object-oriented design approach. **(08 Marks)**

c. Comprehend the benefits of object oriented paradigm. **(04 Marks)**

Module-2

3 a. Explain the overview of the analysis phase of object oriented development. **(04 Marks)**

b. Illustrate the business process of the library system and draw the use-case table for "Book Check out". **(08 Marks)**

c. Give the guidelines to be followed while writing use-cases. **(04 Marks)**

OR

4 a. Enlist the steps involved in design process of object oriented systems. **(04 Marks)**

b. Explain and draw the relationships between the software classes of library system. **(04 Marks)**

c. Write a sequence diagram and Java code for "issuingbooks" from library system. **(08 Marks)**

Module-3

5 a. How do you define an adapter pattern? Illustrate the motivation, structure and implementation steps of an Adapter pattern. **(08 Marks)**

b. "Decouple an abstraction from its implementation so that the two can very independently", detail your understanding of the given problem context with relevant example and its structure. **(08 Marks)**

OR

6 a. Design a simple video game using Fly weight design pattern where players will be moving around the map and shoot each other, that implements a realistic particle system and make it a distinctive feature of the game. Bullets, missiles and shrapnel from explosions should fly over in vast quantities and deliver a thrilling experience to the players. **(06 Marks)**

b. What is decorator pattern? Explain its structure, participants and consequences with example. **(10 Marks)**

Module-4

7 a. What do you mean by interactive systems? Explain MVC architecture in detail with examples. **(05 Marks)**

b. Apply MVC architectural pattern to design a simple program that allows us to create and label figures. Also write a use-case table for "Adding a Label". **(05 Marks)**

c. Draw the sequence diagram for the following for a simple drawing program,
   (i) Sequence of operations for drawing a line.
   (ii) Sequence of operations for adding a label. **(06 Marks)**

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OR

8 a. Describe the process of designing the subsystems of simple drawing program with relevant diagrams. **(08 Marks)**

b. Discuss the issues and schemes of implementing the Undo operation on drawing system. **(04 Marks)**

c. Show how to add a new feature to the interactive system using composite pattern. **(04 Marks)**

Module-5

9 a. Explain Java Remote method invocation. Also elaborate the steps for setting up a remote object system. **(10 Marks)**

b. Detail the advantages and disadvantages of building distributed systems. **(03 Marks)**

c. Give the classification of distributed systems and explain client/server system architecture. **(03 Marks)**

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OR

10 a. Illustrate the hosting of a distributed application taking library system as an example. **(10 Marks)**

b. Draw a state transition diagram for "renewing books". **(06 Marks)**

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