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

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Discuss the step-by-step approach of applying a design patterns effectively. (06 Marks)
- b. Explain the benefits and drawback of object oriented development. (04 Marks)
- c. Illustrate how to maximize reusability of design patterns and explain common causes of redesign. (10 Marks)

OR

- 2 a. Discuss the approaches to find the right design pattern that is suitable for your pattern. (05 Marks)
- b. Explain the key concepts of object oriented diagram with suitable example and diagrams. (15 Marks)

### Module-2

- 3 a. Consider a hotel reservation system supports the following functionalities, write usecases for each and define business rules.
  - i) Room reservation
  - ii) Customer check-in
  - iii) Customer billing
  - iv) Room services. (12 Marks)
- b. Draw class diagram for library system and explain. (08 Marks)

OR

- 4 a. Discuss major steps involved in analysis phase with suitable example and diagram. (12 Marks)
- b. Compare functional requirements versus non-functional requirements with suitable example (library system). (08 Marks)

### Module-3

- 5 a. A system need to be created to manage the Soccer game. Generalize the game pattern for the following operations:
  - i) Start the game
  - ii) Select 2 teams
  - iii) Add or remove players to / from a team
  - iv) Pick playground
  - v) Start a match. (10 Marks)
- b. Describe the motivation, structure, participants and collaborations of composite pattern with suitable diagram and example. (10 Marks)

OR

- 6 a. "Decouple an abstraction from its implementation so that the two can vary independently"  
Justify the statement. (10 Marks)
- b. How do you define an Adapter pattern? Illustrate the motivation and structure of adapter pattern. (10 Marks)

**Module-4**

- 7 a. With a neat diagram, explain MVC architecture and alternative views of the MVC architecture. (10 Marks)
- b. Apply the MVC architectural pattern to the process of designing a simple program that allows us to create and label figures. (10 Marks)

OR

- 8 a. Draw and explain the sequence diagram for adding a line. (05 Marks)
- b. Draw and explain the sequence diagram for adding a label. (05 Marks)
- c. Show the designing of model, view and controller subsystems of simple drawing program. (10 Marks)

**Module-5**

- 9 a. Analyze how library subsystem can be deployed on www with suitable diagrams. (10 Marks)
- b. Write HTML code for entering the library information for books and members details. Also explain uses of GET and POST methods. (10 Marks)

OR

- 10 a. Explain the basic architecture of client/server systems and discuss the methods to overcome the difficulty in accessing objects running different JVM. (10 Marks)
- b. Draw and explain the following:
- i) State transition diagram for issuing books
  - ii) State transition diagram for renewing books. (10 Marks)

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