

**CMR ENGINEERING COLLEGE: : HYDERABAD****UGC AUTONOMOUS****IV–B.TECH–II–Semester End Examinations (Regular) – April - 2025****DESIGN PATTERNS****(CSE)****[Time: 3 Hours]****[Max. Marks: 70]****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

**PART-A****(20 Marks)**

1. a) What are the three main categories of design patterns? [2M]
- b) What factors should be considered when selecting a design pattern? [2M]
- c) What are the main design problems in developing a document editor? [2M]
- d) How does supporting multiple window systems improve software usability? [2M]
- e) What is the main purpose of the Abstract Factory pattern? [2M]
- f) How does the Builder pattern help in object creation? [2M]
- g) What is the role of the Façade pattern in simplifying system complexity? [2M]
- h) How does the Decorator pattern enhance object behavior? [2M]
- i) How does the Visitor pattern help in extending functionalities? [2M]
- j) What is the use of the Memento pattern? [2M]

**PART-B****(50 Marks)**

2. Describe the Smalltalk MVC design pattern and its significance. [10M]
- OR
- 3.a) Compare and contrast design patterns with traditional software development approaches. [5M]
- b) Discuss the importance of organizing the catalog of design patterns. [5M]
- 4.a) How do various design considerations impact the performance and usability of a document editor? [5M]
- b) Explain the process and importance of hyphenation in a document editor. [5M]
- OR
5. How does spell checking work in a document editor? Explain with an example with diagram. [10M]
- 6.a) Discuss about implementation issues in builder design pattern. [5M]
- b) Can we use an abstract factory for supporting multiple window system in Lexi's design? Explain. [5M]
- OR
- 7.a) With a neat diagram explain the motivation and implementation of Abstract Factory Method. [5M]
- b) How does the Builder pattern enhance the readability and maintainability of code? [5M]
- 8.a) Explain the Façade pattern and how it simplifies client interactions with a system. [5M]
- b) Explain the collaborations and consequences of Flyweight pattern. [5M]
- OR
- 9.a) How does the Decorator pattern help in dynamically extending object functionalities? [5M]
- b) Describe the Bridge pattern and how it helps in code maintainability. [5M]
- 10.a) Explain the Chain of Responsibility pattern with an example. [5M]
- b) Discuss the importance of the Iterator pattern and how it simplifies iteration. [5M]
- OR
- 11.a) Explain the Mediator pattern and how it reduces dependencies between objects. [5M]
- b) Compare and contrast the Template Method pattern and the Strategy pattern. [5M]

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