NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: V - CARRY OVER THEORY EXAMINATION - APRIL 2023

Subject: Design Patterns

Time: 3 Hours   Max. Marks: 100

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* **three Sections -A, B, & C.** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

<div align="center">SECTION A   20</div>

1. Attempt all parts:-

1-a.   ——– is a design pattern. (CO1)   1

        (a) Structural

        (b) Abstract Factory

        (c) Behavioral

        (d) All of these

1-b.   Choose one of the following that represents the structure and behavior of the   1
        pattern. (CO1)

        (a) Consequences

        (b) Form

        (c) Application

        (d) Name

1-c.   Among the following patterns which refers to creating duplicate object while   1
        keeping performance in mind.(CO2)

        (a) Builder Pattern

(b) Bridge Pattern

(c) Prototype Pattern

(d) Filter Pattern

1-d.   Choose the pattern that prevents one from creating more than single instance   1
of a variable. (CO2)

(a) Factory Method

(b) Singleton

(c) Observer

(d) None of the above mentioned

1-e.   Choose correct statement for Builder pattern from the following.(CO3)   1

(a) This pattern builds a complex object using simple objects and using a step
by step approach.

(b) This pattern refers to creating duplicate object while keeping performance
in mind.

(c) This pattern is used when creation of object directly is costly.

(d) This pattern is used when we need to decouple an abstraction from its
implementation so that the two can vary independently.

1-f.   Choose one of the following correct statement for Composite Entity pattern.   1
(CO3)

(a) In this pattern, a visitor class is used which changes the executing
algorithm of an element class.

(b) This pattern is used to separate application's concerns.

(c) This pattern is used to decouple presentation tier and business tier.

(d) This pattern is used in EJB persistence mechanism.

1-g.   Choose the valid classification of design pattern.(CO4)   1

(a) Creational

(b) Java

(c) Object

(d) Inheritance

1-h.   MVC Pattern stands for _____ (CO4)   1

(a) Mock View Controller

(b) Model View Controller

(c) Mock View Class

(d) Model View Class

1-i.   Father of Strategic Management is _____ (CO5)   1

            (a) Chandler

            (b) Igor Ansoff

            (c) Michael Porter

            (d) John Nash

1-j.   SWOT stands for _____ (CO5)   1

            (a) Services worldwide optimization and transport

            (b) Special weapons for operations for timeless

            (c) Strength weakness opportunities and threats

            (d) Strength worldwide overcome threats

2. Attempt all parts:-

2.a.   Explain the difference between design patterns and algorithms. (CO1)   2

2.b.   Mention the limitation of using singleton pattern. (CO2)   2

2.c.   Write a short note on Filter Pattern. (CO3)   2

2.d.   Explain the concept of Chain of Responsibility Pattern. (CO4)   2

2.e.   Write Advantage and disadvantage of Strategy design pattern. (CO5)   2

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SECTION B   **30**

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3. Answer any <u>five</u> of the following:-

3-a.   Explain categories of Design Pattern. (CO1)   6

3-b.   List out the approaches we can use to choose the appropriate design pattern.   6
        (CO1)

3-c.   Elaborate the three key strategies in the Abstract Factory. (CO2)   6

3-d.   Write the implementation of a Singleton Java class. (CO2)   6

3.e.   Discuss the Decorator design pattern and explain with example. (CO3) 6

3.f.   Explain the pros and cons of Behavioural Design Pattern. (CO4)   6

3.g.   Write the functioning of the visitor pattern and its importance. (CO5)   6

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SECTION C   **50**

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4. Answer any <u>one</u> of the following:-

4-a.   Write a note on Smalltalk MVC. (CO1)   10

4-b.   Show the importance of the design pattern with the help of an example. (CO1)   10

5. Answer any <u>one</u> of the following:-

5-a.   Mention the goals and constraints in designing the LEXI document.(CO2)   10

5-b. Discuss the related patterns of the factory and builder design pattern. Also   10
explain both of them with the UML diagram. (CO2)

6. Answer any <u>one</u> of the following:-

6-a. Explain the Flyweight Design Pattern (FDP) or Cache Pattern. (CO3)   10

6-b. Explain and mention the difference between Sprint and Scrum. (CO3)   10

7. Answer any <u>one</u> of the following:-

7-a. Discuss Iterator Pattern with its implementation and UML diagram.(CO4)   10

7-b. Elaborate with any test case of Command Pattern with UML diagram and   10
implementation. (CO4)

8. Answer any <u>one</u> of the following:-

8-a. Differentiate between template and strategy pattern. (CO5)   10

8-b. Explain the use and need of UML with some real world applications. (CO5)   10