NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: IV - THEORY EXAMINATION (2023 - 2024)

Subject: Software Design with UML

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.*

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SECTION A   **20**

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1. Attempt all parts:-

1-a.   Each loop in the spiral represents[CO1]   1

(a) Phase

(b) Document

(c) Prototype

(d) Design

1-b.   To hide the internal implementation of an object we use[CO1]   1

(a) inheritance

(b) encapsulation

(c) polymorphism

(d) None

1-c.   Which symbol is used to represent Protected visibility in UML?[CO2]   1

(a) (-)

(b) (#)

(c) (*)

(d) (+)

1-d. Which of the following is not a UML diagram? [CO2]   1

     (a) Class diagram

     (b) Object diagram

     (c) Interface diagram

     (d) Sequence diagram

1-e. The vertcal dimension of a sequence diagram shows[CO3]   1

     (a) abstract

     (b) time

     (c) association

     (d) line

1-f. Lifeline and activations are notations used in[CO3]   1

     (a) Use Case Diagram

     (b) Class diagram

     (c) Sequence Diagram

     (d) Object Diagram

1-g. Which among the following are not the valid notations for package and   1
component diagram?[CO4]

     (a) Notes

     (b) Box

     (c) Extension Mechanisms

     (d) Packages

1-h. Which of the following statement is false?[CO4]   1

     (a) A note is a dog-eared box connected to any model element by a dashed
line

     (b) The main way to extend UML is by constraints, properties, etc

     (c) A dependency relation holds between two entities D and I where change in
I does not affect D

     (d) All of the mentioned

1-i. Which of the statements state the name compartment?[CO5]   1

     (a) The first compartment is the name compartment

     (b) It contains the state name; State names are optional and may be path
names

(c) The name compartment can never be omitted

(d) The first compartment is the name compartment, It contains the state name; State names are optional and may be path names

1-j.   In Design phase, which is the primary area of concern ?[CO5]   1

(a) Architecture

(b) Data

(c) Interface

(d) All of the mentioned

2. Attempt all parts:-

2.a.   Define the terms : Message Passing and Objects[CO1]   2

2.b.   What do you mean by Common Mechanism element in UML[CO2]   2

2.c.   Describe the notations in Collaboration diagram[CO3]   2

2.d.   What do you mean by Dependency in Class Diagram?[CO4]   2

2.e.   Why deployment model are important?[CO5]   2

SECTION B   **30**

3. Answer any five of the following:-

3-a.   Write short notes on following: Design phase, Testing phase and Implementation phase in SDLC[CO1]   6

3-b.   Explain the concept of classes and objects by taking real world application.[CO1]   6

3-c.   Explain the following with respect to UML : 1) Adornments 2) Visibility 3)Specification 4)Stereotypes. [CO2]   6

3-d.   Describe the following Diagrams: 1)Activity diagram 2)Object diagrams 3)Collaboration diagram[CO2]   6

3.e.   Describe about the collaboration diagram in detail.[CO3]   6

3.f.   Discuss about the Black box model of package diagram in detail[CO4]   6

3.g.   Explain the different notations of State diagrams. Discuss the concept of state trigger and deferred event[CO5]   6

SECTION C   **50**

4. Answer any one of the following:-

4-a.   Describe Software Crisis in details with example.Descibe the crisis from the Programmer point of view[CO1]   10

4-b.   Discuss the phases of Waterfall model with its advantages and   10

disadvantages.[CO1]

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

5-a. Define Coupling and Cohesion. What is meant by Low Coupling? . What is meant by high Cohesion? Which one is best Low coupling or high cohesion Support your answer. [CO2]   10

5-b. Define UML with its features. Describe the architecture of UML [CO2]   10

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

6-a. What do you mean by Collaboration diagram ,Discuss the steps how to find object in Collaboration diagram.Design a Collaboration Diagram for Login Module[CO3]   10

6-b. What do you mean by the Sequence diagram? How a Sequence Diagram is related to a Use Case Diagram ?Illustrate with the help of Login module example.[CO3]   10

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

7-a. Discuss the concept of Generalization in detail with its advantages and disadvantages .Differentiate between Aggregation and Generalization[CO4]   10

7-b. Describe the various notations and connections of following diagram:[CO4]
1)Package diagram
2)Class Diagram .   10

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

8-a. Differentiate between Deployment diagram , Package diagram and Component diagram[CO5]   10

8-b. Write short note on :1)Joins 2)Activities 3)Decision node 4)Control flow 5)Guard condition ? [CO5]   10