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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VII - THEORY EXAMINATION (2025 - 2026)

Subject: Object Oriented Programming

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.

SECTION-A

20

1. Attempt all parts:-

- 1-a. Identify the diagram that not supported by UML considering data driven modeling? (K1, CO1) 1
- (a) Activity
- (b) State Diagram
- (c) Data Flow Diagram
- (d) Component
- 1-b. Identify the model in system modelling depicts the dynamic behaviour of the system? (K1,CO1) 1
- (a) Context Model
- (b) Behavioral Model
- (c) Data Model
- (d) Object Model
- 1-c. Activity diagrams in UML are mainly used to represent:(K2, CO2) 1
- (a) Flow of activities and data processing in a system
- (b) Static structure of classes
- (c) Object relationships at runtime
- (d) Physical deployment of software components
- 1-d. Define what happens when an object is passed by reference?(K1,CO2) 1
- (a) Destructor is called at end of function
- (b) Destructor is called when called explicitly
- (c) Destructor is not called
- (d) Destructor is called when function is out of scope

- 1-e. Identify that is not a feature of OOP in general definitions?(K1,CO3) 1
- (a) Efficient Code
 - (b) Code reusability
 - (c) Modularity
 - (d) Duplicate/Redundant data
- 1-f. If a function can perform more than 1 type of tasks, where the function name remains same, which feature of OOP is used here? (K2, CO3) 1
- (a) Encapsulation
 - (b) Inheritance
 - (c) Polymorphism
 - (d) Abstraction
- 1-g. Method arguments in Java are passed by: (K2, CO4) 1
- (a) Reference only
 - (b) Value only
 - (c) Value for primitives and reference for objects
 - (d) Pointer
- 1-h. Garbage collection in Java is used to:(K1, CO4) 1
- (a) Allocate memory
 - (b) Compile code faster
 - (c) Free unused objects automatically
 - (d) Destroy class
- 1-i. Identify the type of inheritance involves a class serving as a superclass for one or more subclasses?(K2, CO5) 1
- (a) Single Inheritance
 - (b) Multiple Inheritance
 - (c) Hierarchical Inheritance
 - (d) Hybrid Inheritance
- 1-j. The default constructor called in a subclass if the superclass has a parameterized constructor.(CO5,K1) 1
- (a) Subclass must explicitly define a constructor
 - (b) Default constructor of the superclass is called
 - (c) It causes a compilation error
 - (d) Superclass constructor is inaccessible
2. Attempt all parts:-
- 2.a. Explain Class diagram? (K1, CO1) 2
- 2.b. State two difference between Process and Thread.(K2, CO2) 2
- 2.c. Explain Polymorphism with example?(K1. CO3). 2
- 2.d. Define what an identifier is in the context of Java programming.(CO4,K1) 2
- 2.e. Explain the concept of "superclass" in inheritance.(CO5,K2) 2

SECTION-B

30

3. Attempt all parts:-
- 3.a. Answer any one of the following:-
- 3.a.(i) Explain Architecture of UML in detail. (CO1,K5) 6
- 3.a.(ii) Demonstrate aggregation using two classes of your choice and show how one class contains a reference to another independent class.(K3,CO1) 6
- 3.b. Answer any one of the following:-
- 3.b.(i) Explain different types of interaction diagrams in UML. (CO2,K5) 6
- 3.b.(ii) Draw a UML class diagram using an actor to represent the interaction between the Teacher and Student classes present in different packages.. (K3,CO2) 6
- 3.c. Answer any one of the following:-
- 3.c.(i) Differentiate between procedural programming and object oriented programming.(K4,CO3) 6
- 3.c.(ii) Implement Method Overriding? and Differentiate between Method Overloading and Overriding?(K3,CO3) 6
- 3.d. Answer any one of the following:-
- 3.d.(i) Explain what an object reference is in Java and how it differs from an object itself. (K2,CO4) 6
- 3.d.(ii) In the context of an abstract class, can class can be declare without have abstract method ? explain with help of example? (K4, CO4) 6
- 3.e. Answer any one of the following:-
- 3.e.(i) Evaluate why calling a superclass constructor is necessary when designing subclass constructors.?(K5. CO5) 6
- 3.e.(ii) Explain throws clause used in a method signature with help of custom exception.(K2,CO5) 6

SECTION-C 50

4. Answer any one of the following:-
- 4-a. Construct a Class Diagram and an Object Diagram for the Employee–Manager system by applying UML modeling principles, and represent the appropriate relationship between both entities.(K3,CO1) 10
- 4-b. Explain the various UML roles involved in forming a model? (K2, CO1) 10
5. Answer any one of the following:-
- 5-a. List out all Behavioral elements in UML and explain each in detail. (K1,CO2) 10
- 5-b. Define a data structure and describe how UML classes contribute to the design and representation of data structures within a system model.(K2, CO2) 10
6. Answer any one of the following:-
- 6-a. Explain advantages of class.How a class can fulfill the features of object oriented programming.(CO3,K5) 10
- 6-b. Achieving a balance between reusability, extensibility, and robustness is a complex task. Explain how these three objectives can sometimes conflict with each other in object-oriented programming. (K4,CO3) 10
7. Answer any one of the following:-
- 7-a. Demonstrate with an example how nested If statements can be used in Java. Explain 10

the advantages and potential pitfalls of using nested If statements.(K3,CO4)

7-b. Discuss how constructors are used in abstract classes in Java. Provide examples to illustrate how constructors work in abstract classes and their importance in the context of object initialization.(K2,CO4) 10

8. Answer any one of the following:-

8-a. Explain the purpose and syntax of the try-catch block in Java. Discuss how it allows the programmer to handle exceptions gracefully. Provide examples to illustrate the use of try and catch blocks, including scenarios where exceptions are caught and handled.(CO5,K5,K2,K3) 10

8-b. Explain the purpose and usage of the throw keyword in Java. Discuss how it is used to explicitly throw an exception in a program. Provide examples to illustrate scenarios where the throw keyword is employed to handle exceptional situations. K4,CO5 10

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