Code No: R1631053 **R16** SET - 1

III B. Tech I Semester Regular/Supplementary Examinations, March - 2021

OBJECT ORIENTED ANALYSIS AND DESIGN USING UML

(Computer Science and Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A (14 Marks)

1. a) Define software quality. [2M]
   b) Write about the relationships between Classes and Objects with an example. [2M]
   c) "UML is a language for constructing" –Justify the statement. [2M]
   d) Differentiate procedural sequencing and flat with an example. [3M]
   e) What is the importance of time and location in modeling? [3M]
   f) Describe the importance of binary replicability in component diagrams. [2M]

PART –B (56 Marks)

2. a) Discuss various types of instances to define the structure of the complex systems. [7M]
   b) Write about Object-Oriented Decomposition. And explain the role of abstraction and hierarchy in it. [7M]

3. a) What is and what is not an object? Discuss the nature of an object with respect to state and behavior. [7M]
   b) How the selection of operations, relationships and implementations will affect the design of classes and objects. [7M]

4. a) Explain various building blocks used to build the Vocabulary of UML. [7M]
   b) List and explain four kinds of relationships used to write well-formed models in the UML. [7M]

5. a) Identify use cases, actors and their relations ships in Call over cellular phone system and model the context of the system. [7M]
   b) What are the contents of activity diagram? Explain in detail and model the workflow of retail business sales with activity diagram. [7M]

6. a) How to model communication and synchronization of processes and threads? Explain with process views. [7M]
   b) Write about advanced states and transitions, sub-states and concurrent sub-states and model the life time of object with these concepts. [7M]

7. a) Describe the contents of component diagrams and model the physical database in an e-shopping system case study. [7M]
   b) Write and explain common modeling techniques used for deployment diagrams. [7M]

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Code No: R1631053 **R16** SET - 2

III B. Tech I Semester Regular/Supplementary Examinations, March - 2021

OBJECT ORIENTED ANALYSIS AND DESIGN USING UML

(Computer Science and Engineering)

Time: 3 hours Max. Marks: 70

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2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A (14 Marks)

1. a) Why software is inherently complex in nature? Explain. [2M]
   b) What is the role of Classes and Objects in Analysis and Design? [2M]
   c) "UML is a language for visualizing"-Justify the statement. [2M]
   d) How to specify the communication among objects using a message? Explain. [3M]
   e) Draw state chart diagram for modeling reactive objects. [3M]
   f) How to view the static aspect of nodes and their relationships using deployment diagram? Give example. [2M]

PART –B (56 Marks)

2. a) "When designing a complex software system, it is essential to decompose it into smaller and smaller parts" –Justify this statement with the importance of decomposition. [7M]
   b) Discuss the following foundations of object model: Object Oriented Programming, Design and Analysis. [7M]

3. a) What is and What is not a class? Demonstrate the life cycle of class and relate them with interface and implementation. [7M]
   b) How to build quality classes and objects with the help of metrics? Explain. [7M]

4. a) Explain the importance of modeling with an example. [7M]
   b) Explain structural things, behavioral things and grouping things as the object-oriented building blocks of UML. [7M]

5. a) How to organize use cases? Model the behavior of the elements in retail systems. [7M]
   b) Explain the common properties of interaction diagrams and modeling the flow of control by time ordering. [7M]

6. a) In detail explain about time and space constraints and how to model them? [7M]
   b) Explain the modeling of distribution of objects and objects that migrate with an example. [7M]

7. a) Write about: i) components vs classes; ii) Components vs interfaces; iii) Kinds of components. [7M]
   b) Explain the common modeling techniques used for modeling the source code and executable release using components diagrams. [7M]

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Code No: R1631053 **R16** SET - 3

III B. Tech I Semester Regular/Supplementary Examinations, March - 2021

OBJECT ORIENTED ANALYSIS AND DESIGN USING UML

(Computer Science and Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A (14 Marks)

1. a) What is the difficulty in managing the software development process? Discuss. [2M]
   b) Write a short note on functional semantics used in OOPS development. [2M]
   c) Where can the UML are used? Explain the applications of it. [2M]
   d) Explain the functionality of objects, roles and links. [3M]
   e) Describe the contents of state chart diagrams. [3M]
   f) Write about the reverse engineering of component diagram with an example. [2M]

PART –B (56 Marks)

2. a) Explain the two orthogonal hierarchies of the system: Class structure and Object structure. [7M]
   b) Discuss various steps involved in the evolution of the object model. [7M]

3. a) Explain Links and aggregation object relationships in object-oriented analysis and design with suitable examples. [7M]
   b) Describe the role of Coupling, Cohesion, Sufficiency, Completeness and Primitiveness metrics to know if a given class or object is well designed? [7M]

4. a) Explain how UML is used for visualizing, specifying, constructing and documenting the artifacts of a software-intense system. [7M]
   b) Write about the basic concepts and terms used in the representation of class diagrams and model the vocabulary of the system using class diagrams. [7M]

5. a) Explain the following with respect to use case diagrams: [8M]
      i) Use cases and Actors, ii) Flow of events, iii) Scenarios, iv) Collaborations.
   b) How to model the requirements of the system? Explain with suitable example. [6M]

6. a) Model the system that depicts the flows of control and inter process communication. [7M]
   b) Explain states, events, actions and transitions and draw an example of state machine with these concepts. [7M]

7. a) Write about the common modeling techniques used for modeling executables and libraries and modeling an API using components. [7M]
   b) Identify the contents and common uses of deployment diagram and model the client/server system. [7M]

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Code No: R1631053 **R16** SET - 4

III B. Tech I Semester Regular/Supplementary Examinations, March - 2021

OBJECT ORIENTED ANALYSIS AND DESIGN USING UML

(Computer Science and Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A **(14 Marks)**

1. a) What are the problems of characterizing the behavior of Discrete Systems? [2M]
b) Write about the meaningful metrics to measure the quality of abstraction. [2M]
c) Differentiate classes, interfaces and active classes. [2M]
d) Write about creation, modification, representation and destruction operations. [3M]
e) Draw the state chart diagram which describes the event ordered behavior. [3M]
f) Write a short note on simple and extended components. [2M]

PART –B **(56 Marks)**

2. a) Explain five attributes which are common to all complex systems. [7M]
b) Write about the conceptual framework of the object model and four major elements of object model. [7M]

3. a) Explain the role of aggregation and inheritance to establish the relationships between classes. [7M]
b) Identify classes and objects for Air Traffic Control System and establish the relationships among them and explain. [7M]

4. a) Explain five different views used to visualize a system from different perspectives. [7M]
b) What are the common mechanisms that are applied consistently throughout the usage of the UML? Explain in detail. [7M]

5. a) How to model flow of control? Explain flow of control by time and organizations with examples. [7M]
b) Explain the common modeling techniques of use case diagrams and forward and reverse engineering concepts. [7M]

6. a) Write about: i) Processes and threads, ii) Classes and events, iii) State machine. [7M]
b) With an example explain the various parts of states and transitions. What is the role of triggers and actions in it? [7M]

7. Describe the following with respect to deployment: [14M]
i) Nodes and Components
ii) Organization of nodes
iii) Modeling processors and devices and distribution of components.

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