



**P.E.S. College of Engineering, Mandya - 571 401**  
 (An Autonomous Institution affiliated to VTU, Belagavi)  
**Third Semester, Master of Computer Applications (MCA)**  
**Semester End Examination; Dec. - 2019**  
**Object Oriented Modeling and Design Patterns**

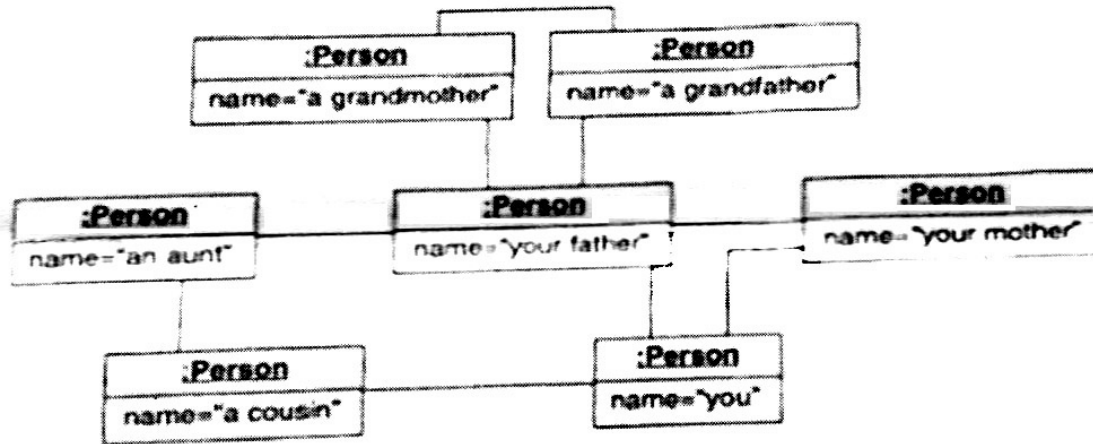
Time: 3 hrs

Max. Marks: 100

*Note: Answer FIVE full questions, selecting ONE full question from each unit.*

**UNIT - I**

- 1 a. Define Object Orientation. Discuss characteristics of Object Orientation. 6
- b. Differentiate; 8
  - i) Value and Attribute ii) Link and Association
  - iii) Object diagram and Class diagram iv) Aggregation versus Composition
- c. Prepare a class diagram for the object diagram given below. Add on suitable association names and multiplicity to each association.



- 2 a. Explain the three models in OO approach by comparing each other. 6
- b. Differentiate between the following with examples: 8
  - i) Ordering ii) Sequence iii) Bags
- c. Explain the need for an association class qualified associations. Give an example. 6

**UNIT - II**

- 3 a. Define Event and explain the three types of events with example. 10
- b. Draw state diagram for phone line with suitable activities in response to events. 10
- 4 a. Explain activity effects, do-activity and entry/exit activities with example. 10
- b. Justify the need for nested state diagrams. With the help of an example, explain how nested state diagram can be represented in UML? 10

**UNIT - III**

- 5 a. List out the guidelines for Activity models. Draw the activity diagram for bank transaction (Withdrawal process). 5
- b. Differentiate active objects and passive objects in sequence diagrams using an example. 5
- c. Explain the sequence of stages along with its purpose in software development. 10
- 6 a. Define include extend and generalization relationship in use case modeling with example. 5
- b. Briefly explain any three steps used in constructing a domain class model. 5
- c. With example, explain the uses of Swimlanes and sending/receiving signals in activity models. 10

**UNIT - IV**

- 7 a. Explain in detail the methods involved in decomposition of system into subsystems. 10
- b. Discuss about bridging the gap concept and realizing use cases in class design. 10
- 8 a. Explain in detail the common architectural styles used in the system design. 10
- b. Discuss the designing algorithm steps in class design model. 10

**UNIT - V**

- 9 a. Define pattern. Discuss three-part schema of pattern. 6
- b. Describe the pattern template. 8
- c. Explain the structure and dynamics of forwarder-receiver pattern. 6
- 10 a. Compare and contrast the three categories of patterns. 6
- b. Describe a typical scenario of a command processor pattern for text editor with necessary steps and diagrams (Use case and State diagrams). 8
- c. Explain the Internet, Context and participants of Command processor pattern. 6

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