

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**B.Tech., Winter 2017 - 18 Examination**

**Semester: 4**  
**Subject Code: 03105251**  
**Subject Name: Object Oriented Analysis & Design with UML**

**Date: 10/01/2018**  
**Time: 10:30am to 1:00pm**  
**Total Marks: 60**

**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

- Q.1 Objective Type Questions - (15)**
1. UML stands for ..... **1**
  2. Inheritance in object-oriented modeling can be used to **1**
    - a. generalize classes                      b. specialize classes
    - c. generalize and specialize classes   d. create new class
  3. Categorize the following relationships into generalization, aggregation or Composition. **2**
    - (a) A file is an ordinary file or a directory file.
    - (b) College and class rooms
  4. The same operation behave differently for different classes are called? **1**
  5. State model describe the aspects of object that change over the time. **True/False 1**
  6. A state is an occurrence at a point in time. **True/False 1**
  7. Composition is a special form of association? **True/False 1**
  8. A transition takes the object from one state to another state? **True/False 1**
  9. The interaction model describes how the objects interact? **True/False 1**
  10. A..... is a sequence of events that occurs during one particular execution of a system. **1**
  11. The..... Describe the static structure of objects in a system and their relationship. **1**
  12. A ... is an abstraction that describes properties important to an application and ignores the rest. **1**
  13. . ..... is the sharing of attributes and operations among classes based on a hierarchical relationship. **1**
  14. A ..... is a physical or conceptual connection among objects. **1**
- Q.2 Answer the following questions. (Attempt any three) (15)**
- A) What is an abstract class? Write the difference between abstract class and concrete class.
  - B) What do you mean by Aggregation? Explain with an example
  - C) Define the purpose of following terms with suitable example and UML notations with respect to class model.
    - (i) Qualified association (ii) Association class (iii) Aggregation
  - D) Discuss Link and association concepts with example.
- Q.3 A) What is the use of “include” and “extends” relationships in use-case diagram? Draw the use-case diagram for Online Admission Process for Engineering Students in Parul University. (07)**
- B) A simple digital watch has a display and two buttons to set it, the A button and the B button. The watch has two modes of operation, display time and set time. In the display time mode, the watch displays hours and minutes, separated by a flashing colon. The set time mode has two sub modes, set hours and set minutes. The A button selects modes. Each time it is pressed, the mode advances in the sequence: display, set hour, set minutes, display, etc. Within the sub modes, the B button advances the hours or minutes once each time it is pressed. Buttons must be released before they can generate another event. Prepare a State diagram of the watch (08)**

**OR**

- B)** Prepare a class diagram for a graphical document editor that supports grouping. Assume that a document consists of several sheets. Each sheet contains drawing objects, including text, geometrical objects and groups. A group is simply a set of drawing objects, possibly including other groups. A group must contain at least two drawing objects. A drawing object can be a direct member of at most one group. Geometrical objects include circles, ellipses, rectangles, lines and squares. **(08)**

**Q.4 A)** Define Actor and Use case. Draw Use case diagram for an ATM system. **(07)**

**OR**

- A)** Draw a sequence diagram for a session for purchasing stock with an online stock broker system and security exchange system. **(07)**

- B)** Prepare a class model for the hotel management system. The system should supports chain of hotels. A hotel contains two categories of rooms: executive and normal, both AC and non-AC. The customers of executive rooms can avail extra facilities like games, swimming, food service in rooms, etc. The booking is possible by internet or by phone. If the booking is through phone, process is done by receptionist, and if booking is done through internet the process is carried out by customer through hotel website. Depending on the number of days customer stays, appropriate bill is generated. The bill also contains amount for transport, food and other facilities enjoyed by the customer along with necessary taxes. The manager should be able to generate reports like list of customers staying in the hotel, list of rooms empty, monthly/yearly income, etc. **(08)**