

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MCA - SEMESTER– III EXAMINATION – SUMMER 2016**

**Subject Code:2630001****Date: 24/05/2016****Subject Name:Structured and Object Oriented Analysis and Design Methodology****Time:02:30 P.M. to 05:00 P.M.****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Attempt the following:
1. Define the terms : widgets and gadgets. **02**
  2. List basic symbols of DFD with their meaning. **02**
  3. Explain Reification and Bipolar questions. **02**
  4. Justify: Infrequently accessed output that is needed by only a few users is well suited to a pod cast. **01**
- (b)** Attempt the following:
1. How to apply constraint on links? Explain. **02**
  2. Cipher codes can be used to reveal the information.Justify this statement. **01**
  3. Justify: Consistency of data can be one of the reasons for partitioning Data Flow Diagram. **01**
  4. List different types of relationships in UML with symbol. **01**
  5. Which two constraints make aggregation relationship into composition? **01**
  6. Justify: Object flow can be represented in use case diagram. **01**
- Q.2 (a)** 1. Prepare a class diagram for dining philosopher problem. There are 5 philosophers and 5 forks around a circular table. Each philosopher has access to 2 forks, one on either side. Each fork is shared by 2 philosophers. Each fork may be on the table or in use by one philosopher. A philosopher must have 2 forks to eat. **03**
2. Prepare a class diagram for the following group of classes. Add all necessary relationships in the diagram. Do not show any attribute or operation:  
 Automobile, engine, wheel, brake, brake light, door, battery, muffler, tail pipe. **04**
- (b)** Prepare a state diagram that describes the process of passing a graduate course as a set of concurrent activities. The process has as follows: To pass, a student has to attend all but two lectures, present to the class a paper she read, and complete a course project, due on the last day of the term. To give her presentation, the student is given a date by the instructor, prepares her presentation, and gives it on the assigned day. At any time, the student can drop the course. Make sure to define events, conditions, actions for transitions in your diagram, where appropriate. **07**
- OR**
- (b)** An extension ladder has a rope, pulley and latch for raising, lowering and locking the extension. When the latch is locked, the extension is mechanically supported and you may safely climb the ladder. To release the latch, you raise the extension slightly with the rope. You may then freely raise or lower the extension. The latch produces a clacking sound as it passes over rungs of the ladder. The latch may be rearranged while raising the extension by reversing direction just as the latch is passing a rung. Prepare a state chart diagram for an extension ladder. **07**
- Q.3 (a)** Describe the purpose of SDLC. Draw the diagram for SDLC and explain all the steps of analysis and design of a system. **07**
- (b)** 1. Justify: JAD is used to collect requirements from users with brain storming sessions. Also suggest team structure for JAD and requirement of locations. **04**
2. Differentiate logical and physical DFD. **03**
- OR**
- Q.3 (a)** List different steps for developing DFD. Prepare context flow and level – 0 diagram for **07**

Purchase system. It is involving entities like inventory department, receiving department and supplier. Make assumption about the processes involved in purchasing items from supplier and providing to receiving department.

- (b) 1. Justify the statement: The fit affects performance and well well being in HCI. **02**  
2. List the steps for building decision table. Explain them with appropriate example. **05**
- Q.4** (a) Discuss various types of user interfaces and justify their suitability. **07**  
(b) Explain the guidelines required to follow for designing good display and Web forms. **07**
- OR**
- Q.4** (a) How will you ensure data quality through input validation? Explain different methods. **07**  
(b) List and explain various building blocks of vocabulary of UML. **07**
- Q.5** (a) 1. How will you use include and extend relationship in use case diagram? Explain with example. **04**  
2. Explain activity state and action state with example. **03**  
(b) Railway Reservation System is a system used for booking tickets over internet. Any Customer Can book tickets for different trains. Customer can book a ticket only if the tickets are available. Customer searches for the availability of tickets then if the tickets are available he books the tickets by initially filling details in a form. Tickets can be booked in two ways by i-ticket or by e-ticket booking. **07**  
In case of i-ticket booking customer can book the tickets online and the tickets are couriered to Particular customer at their address. But in case of e-ticket booking and canceling tickets are booked and canceled online sitting at the home and customer himself has to take print of the ticket but in both the cases amount for tickets are deducted from customers account.  
For cancellation of ticket the customer has to go at reservation office than fill cancellation form and ask the clerk to cancel the ticket than the refund is transferred to customer account. After booking ticket the customer has to checkout by paying fare amount to clerk.  
Prepare use case and sequence diagram for the proposed system.
- OR**
- Q.5** (a) 1. List common mechanisms in UML. Explain with diagram. **04**  
2. Discuss the purpose of use of swimlanes in activity diagram with example. **03**  
(b) Prepare activity and collaboration diagram for case study of Q. 5 (b). **07**

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