

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

## GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-IV Remedial Examination Nov/ Dec. 2010

Subject code: 140703

Subject Name: Object Oriented Analysis Design And UML

Date: 06 / 12 / 2010

Time: 03.00 pm – 05.30 pm

Total Marks: 70

### Instructions:

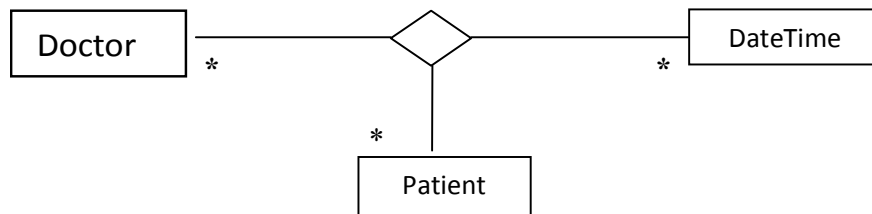
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (A)** (a) Define and Discuss the following OO characteristics. Identity, Classification, Inheritance, Polymorphism. **04**
- (b) Define Model. Briefly discuss its purposes. **03**
- (B)** (a) Describe Iterative software development life cycle. **03**
- (b) Discuss the relationships among Class model, state model and Interaction model. **04**
- Q.2 (A)** Categorize the following relationships into generalization, aggregation or association. Justify your answer. **07**
- (1) A country has a capital city.
- (2) A file is an ordinary file or a directory file.
- (3) Files contain records.
- (4) A polygon is composed of an ordered set of points.
- (5) A drawing object is text, a geometrical object, or a group.
- (6) A route connects two cities.
- (7) A student takes a course from a professor.
- (B)** (a) Describe the questions for elaborating a system concept. **03**
- (b) Discuss the steps for application interaction model. **04**
- OR**
- (B)** (a) Briefly describe the steps for constructing a domain class model. **04**
- (b) What is pattern? What are its advantages? **03**
- Q.3 (A)** (a) What is operation overriding? Discuss the reasons for override? **03**
- (b) Prepare a class diagram for the 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 either on the table or in use by one philosopher. A philosopher must have 2 forks to eat. **04**
- (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. **07**

**OR**

- Q.3 (A)** (a) The link of an association can have attributes. Explain by appropriate example **04**  
 (b) Discuss visibility concepts in class modeling. **03**  
**(B)** (a) Define Package. Draw its notation **03**  
 (b) Eliminate ternary association. **04**

In figure below is a relationship between Doctor, Patient, and DateTime that might be encountered in a system used by a clinic with several doctors on the staff. The combination of DateTime + Patient is unique as well as DateTime + Doctor.



- Q.4 (A)** Define Event, State and Transition. Using example draw state diagram. **07**  
**(B)** (a) Explain nested states with appropriate diagram. **03**  
 (b) Explain Domain state model. **04**

**OR**

- Q.4 (A)** Discuss with suitable diagram **07**  
 (a) Aggregation concurrency (b) Concurrency within an object.  
**(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. **07**

- Q.5 (A)** Prepare an activity diagram for computing a restaurant bill. There should be a charge for each delivered item. The total amount should be subject to tax and a service charge of 18% for groups of six or more. For smaller groups, there should be a blank entry for a gratuity according to the customer's discretion. Any coupons or gift certificates submitted by the customer should be subtracted. **07**  
**(B)** (a) Define Actor, Use case. Draw suitable example Scenario diagram. **04**  
 (b) Discuss data storage management in system design. **03**

**OR**

- Q.5 (A)** Describe following use case relationship: **07**  
 include, extend, generalization.  
**(B)** (a) Define scenario, sequence diagram. Explain with suitable diagram. **04**  
 (b) Discuss the steps that can improve the organization of a class design. **03**

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