Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-IV Examination-Nov/Dec-2011

Subject code: 140703   **Date: 28/11/2011**
Subject Name: Object Oriented Analysis Design And Uml
Time: 02.30 pm -5.00 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) **07**

    (i) Prepare a class diagram for group of classes. **04**
        Sink, freezer, refrigerator, table, light, switch, window, smoke alarm, burglar alarm, cabinet, bread, cheese, ice, door, kitchen

    (ii) Consider an online airline reservation system. **03**
        a. List two actors. Explain the relevance of each actor.
        b. Prepare a use case diagram for an online reservation system.

(b) Draw the state of a Car as an aggregation of part states (ignition, transmission, accelerator, brake). Draw the state diagrams of all the part states. **07**

Q.2 (a) **07**

    (i) What is the difference between multiplicity and cardinality? What is the effect of underestimating or overestimating multiplicity? **04**

    (ii) Prepare scenario for the following exception in ATM example. **03**
        a. The amount is invalid.
        b. The communication lines are down.

(b) What does the term object oriented mean? Explain the four aspects included in object oriented approach? **07**

OR

(b) Draw a sequence diagram for issuing a book and renewing a book in online library management system. **07**

Q.3 (a) **07**

    (i) Prepare a metamodel that supports only the following UML concepts: class, attribute, association, association end, multiplicity, class name, and attribute name. Use only these constructs to build metamodel. **04**

    (ii) Explain the term horizontal layers and vertical partitions in decomposition of systems into subsystems. **03**

(b) What is an event? Explain the signal event, the change event and the time event. **07**

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OR

Q.3 **(a)** **07**

    (i) Explain batch transformation system for common architectural style. **04**

    (ii) Explain continuous transformation system for common architectural style **03**

(b) What is the purpose of one shot state diagram? What is the difference between continuous loops or one shot life cycle state diagrams? Draw the one shot diagram for the chess game. **07**

Q.4 **(a)** Explain the following terms in relation to generalization and inheritance. **07**
    a. Generalization set name
    b. override

(b) Explain the steps to be performed to design algorithm. **07**

OR

Q.4 **(a)** Explain the following terms in relation to class design. **07**
    a. Refactoring
    b. reification

Q.4 **(b)** 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 service charge of 18% for groups of six of 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**

Q.5 **(a)** **07**

    (i) The relationship between document and paragraph should be modeled as association, aggregation or composition? Justify answer. **04**

    (ii) What classes require state diagrams in domain state model? How relevant states and events can be found out? **03**

(b) Write the sequence of stages in software development. **07**

OR

Q.5 **(a)** What is an abstract class? What is a concrete class? Explain with example abstract class and abstract operation. **07**

(b) Explain redundant classes, irrelevant classes, vague classes in domain class model. **07**

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