08SCS251

USN ☐☐☐☐☐☐☐☐☐☐

Second Semester M.Tech. Degree Examination, June/July 2011
OOAD and Design Patterns

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions.*

1 a. Describe the three types of models used in the analysis of object oriented systems. **(10 Marks)**
   b. Using UML notations, explain with examples i) Association classes ; ii) Qualified associations and iii) Aggregation and composition.   **(10 Marks)**

2 a. Describe the different kinds of events that are of importance. Explain what is meant by a state diagram.   **(12 Marks)**
   b. A simple digital watch has a display and two buttons A and B. The watch has two modes of operation. In the display time mode, it displays hours and minutes separated by a flashing colon. In the set time mode, there are two submodes namely set hours and set minutes. The A button selects modes. When A is pressed the mode advances in the sequence: display, set hours, set minutes. Inside each submode, the B button when pressed advances the hours or minutes. Buttons must be released before they can generate another event. Draw a state diagram for the watch.   **(08 Marks)**

3 a. Explain use case diagrams and the "include" and "extend" relationships in use cases. Give their UML representations. Draw the figure and explain the use case diagram for a vending machine.   **(10 Marks)**
   b. What are sequence diagrams? Draw the sequence diagram for withdrawal of funds from the ATM machine shared by a consortium of banks.   **(10 Marks)**

4 a. What are activity diagrams? Draw and explain the activity diagram for stock trade processing.   **(10 Marks)**
   b. Explain the different steps involved in the construction of a domain class model.   **(10 Marks)**

5 a. Explain the different steps involved in the construction of the application class model and hence explain boundary classes and controller classes.   **(10 Marks)**
   b. Draw and explain the state diagram for the transaction controller of the ATM example.
                                                                                     (10 Marks)

6 a. Explain the several prototypical architectural styles that are commonly formed in existing systems.   **(10 Marks)**
   b. Describe the model-view-controller pattern.   **(10 Marks)**

7 a. Describe the different pattern categories.   **(08 Marks)**
   b. Describe the pattern description template and use this to briefly explain the whole-part design pattern.   **(12 Marks)**

8   Write brief notes on the following :
   a. Class and object diagrams.
   b. Three part schema of patterns.
   c. Swim lanes in activity diagrams.
   d. N-ary associations.   **(20 Marks)**

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