Library B.E. (Electrical) (SEM VII) (New) 28/12/07

Object Oriented Analysis & Design

znd-r-12-Dec-Nk-07 -16

Con. 5522-07. CD-7086

(REVISED COURSE)

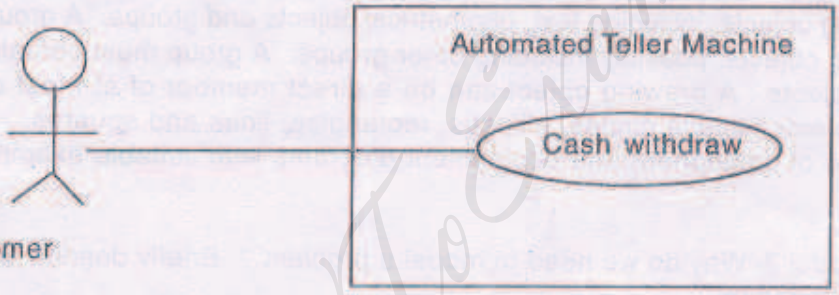
(3 Hours) [Total Marks : 100

MASTER

N.B. (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** questions out of remaining **six**.
(3) Illustrate answers with **sketches** wherever **required**.
(4) **Figures** to the **right** indicate **full** marks.
(5) Assumptions made should be **clearly** stated.
(6) Use **standard** and **correct symbols** for the **diagrams**.

1. Answer any **four** :—
   (a) What is a use case diagram ? And when should we use it ? 5
   (b) What is the different between class diagram and an object diagram ? Explain it with suitable example. 5
   (c) What is the difference between uses and extends with reference to a use-case ? Explain it with suitable example. 5
   (d) List the object oriented design axioms and corollaries. 5
   (e) How is software verification different from validation ? 5

2. (a) Identify four different execution paths for the above use-case and draw a sequence diagram for each. 12



   (b) Discuss various types of relationships between classes. 8

3. Draw a detailed Class diagram, State transition diagram and a Collaboration for the following : 20
   A product is to be installed to control elevators in a building with 'N' floors. The problem concerns the logic required to move elevators between floors according to following constraints. Each elevator has a set of 'M' buttons, one for each floor. These illuminate when pressed and cause the elevator to vist the corresponding floor. The illumination is cancelled when the elevator visit the corresponding floor.
   Each floor except the first floor and top floor has two buttons, one to request an up-elevator and one to request a down-elevator. These buttons illuminate when pressed. The illumination is cancelled when an elevator visits the floor and then moves in the desired direction.

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4. The direction control for some of the first toy electric trains was accomplished by interrupting the power to the train. Prepare state diagram and interaction diagram for the head light and wheels of the train, corresponding to the following scenario. 20
   —Power is off, train is not moving
   —Power is turned on, train moves forward and train head light shines.
   —Power is turned off, train stops and head light goes out.
   —Power is turned on, head light shines and train does not move.
   —Power is turned off, head light goes out.
   —Power is turned on, train runs backward with its head light shining.
   —Power is turned off, train stops and head light goes out.
   —Power is turned on, head light shines and train does not move.
   —Power is turned off, head light goes out.
   —Power is turned on, train runs forward with its head light shining.

5. You are appointed as a consultant for the intranet development of your Institute. You have to manage the web site of your institute containing departmental information, library information, alumina data. Identify two valid use cases for the above specification and document them in detail. 20

6. (a) Prepare an Object diagram for the following scenario. 10
   A graphical document editor that supports grouping, which is a concept used in variety of graphical editors. Assume that a document is composed 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 contains 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.
   (b) Discuss the use of component and deployment diagrams with suitable example. 10

7. Answer any two :—
   (a) What is model ? Why do we need to model a problem ? Briefly desribe static model and dynamic model. 10
   (b) What is Forward Engineering and Reverse Engineering ? Explain using examples for each. 10
   (c) What is the purpose of analysis and why is analysis a difficult task ? 10

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