[5059]-662

B.E. (I.T.) (Semester - I)

SOFTWARE MODELING & DESIGN

(2012 Pattern)

Time : 2.30 Hours]   *[Max. Marks : 70*
Instructions to the candidates:
    1)   Solve Qi or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10.
    2)   Use UML2.O notations to draw the UML diagrams.

Q1) a)   In the context of class diagram show a generalization and aggregation relationship with the help of one example each.   **[6]**

    b)   In the context of state diagram, define state, trigger, guard and effect. **[4]**

OR

Q2) a)   Convert the following description into a class diagram. Show classes, relationships and multiplicities.   **[6]**

    In a university there are different classrooms, offices and departments. A department has a name and it contains many offices. A person working at the university has a unique ID and can be a professor or an employee. A professor can be an associate or assistant professor and he/she is enrolled in one department. Offices and classrooms have a number ID, and a classroom has a number of seats. Every employee works in an office.

    b)   Draw a use case diagram with appropriate relationships and notations for the following description

    A software is to be developed for an alarm clock simulation. User can choose a display mode of 12 hour display or 24 hour display. User can set time, user can set alarm, turn off alarm or snooze.   **[4]**

Q3) a) With the context of activity diagram, elaborate fork and join with the help of an example. **[6]**

b) The use case login accepts the userid and password from the user. The system validates them and displays the message that 'UserId or password is invalid'. Draw a sequence diagram for this. **[4]**

OR

Q4) a) Draw a state diagram for a fax machine and show entry, exit and do behavior. Initially, the machine is in the idle state. It displays the date and time in this state. When the user dials a fax number, the machine remains in the idle state till the number dialing is complete. After the number is completely dialed, it goes into the faxing state. Being in this state, it prints the fax on the page, it pulls the page out, it paginates, puts a date, time and owner stamp at the end of the fax message which it prints. After the fax printing is complete, it goes back to idle state. **[6]**

b) Draw a use case diagram with appropriate relationships and notations for the following description.

Consider an online travel planner software. Through this software, the user can book bus tickets, provide payment information, provide address, book a car on rent, book a hotel room. It is mandatory to provide payment information and provide address for booking of bus tickets, car on rent and a hotel room. **[4]**

Q5) a) Write a note on Making a Reuse Plan from the context of system design.**[8]**

b) Which are the boundary conditions & how they are handled? **[8]**

OR

Q6) a) Describe one way of breaking a system into subsystems. **[8]**

b) Describe allocation of subsystems in System Design. **[8]**

Q7) a) Write the classification, motivation, class diagram and uses of adapter design pattern. **[8]**

b) Write the classification, motivation, class diagram and uses of observer design pattern. **[8]**

Q8) a) Write the classification, motivation, class diagram and uses of strategy design pattern. **[8]**

b) Write the classification, motivation, class diagram and uses of state design pattern. **[8]**

Q9) a) Draw a flow chart of test driven development. **[8]**

b) Features of printer are to be tested & its specification is as follows. **[10]**

It prints the document in black & white , colour. It has an on/off button. It accepts A4 paper one at a time for printing. It has two LED lights. Green light shows normal printing operation & red light shows problem with printing. It has two cables. One is power cable & other is data cable, which is connected to the CPU.

Write at least five test cases to check that the Printer machine works properly.

OR

Q10 a) Differentiate Black box testing and white box testing on the basis of definition, levels of testing, basis for test cases, responsibility of testing.**[8]**

b) Write at least five test cases for following Screen. **[10]**

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