

Total No. of Questions : 9]

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SEAT No. :

[Total No. of Pages : 4

[5670]-723

B.E. (Information Technology)
SOFTWARE DESIGN AND MODELING
(2015 Pattern) (Semester - I) (414455) (End sem.)

Time : 2½ Hours]

[Max. Marks :70

Instructions to the candidates:

- 1) Answer Question Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, and Q9
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.

SECTION-I

Q1) a) Explain the Bidirectional, Unidirectional & Reflexive Association; with an example. **[5]**

b) ABC Finance Company has given the following software requirements to develop a system. The company has many branches which are grouped into zones. Each zone has a zonal head office which manages the branches in that zone. Each Zonal head office has a Zonal Manager. Each company branch can have many deposit accounts and loans accounts. Account can be of either of Type Individual or type corporate. Customer can open either account of type individual or type corporate. The customer can also procure loans from company. Assume any missing information:

Identify Actor and Use cases and draw use case diagram. **[5]**

OR

Q2) a) What are the phases of OMT? Briefly describe each phase. **[5]**

b) ABC finance company has given the following software requirements to develop a system. The company has many branches which are grouped into zones. Each zone has a zonal head office which manages the branches in that zone. Each Zonal head office has a zonal manager. Each company branch can have many deposit accounts and loans accounts. Account

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can be of either of type individual or type corporate. Customer can open either account of type individual or type corporate. The customer can also procure loans from company. Assume any missing information:

Draw the Domain model for above description. show the associations and multiplicities clearly. [5]

Q3) a) Explain concurrent sub-states with suitable examples. [5]

b) Passport is one of the identity criteria in our country. It is compulsory for those who travel foreign country. Passport automation system uses effective dispatch of passport to all of applicants. The system adopts a comprehensive approach to minimize the mutual work and schedule resources, and time in issuing passport. Applicant fill online registration form(with details such as name, address etc).and is verified for its genuineness by passport automation system with respect to already existing information in the database. This forms the first and for most step in the processing of passport application. After the first round of verification done by the system, the information is in turn forwarded to the regional administrator's (ministry of external affairs) office. The application is then processed manually based on report given by the system, and any forfeiting identified can make the applicant liable to penalty as per law. System forwards the necessary details to the police for its separate verification, whose report is then presented to the administrator. After all the necessary criteria have been met, the original information is added to the database and the passport is sent to the applicant by its own dispatch system.

Draw the activity diagram for above description using swim lanes [5]

OR

Q4) a) The following description represents a banking scenario in which a bank customer applies for a loan by following this process. [5]

- A customer gives an application for the loan to a bank teller.
- The bank teller sends the application to the bank manager to process and waits for the manager to finish.
- The bank manager starts the credit check program, enters the data, and waits for the credit agency to send the results.
- The bank manager receives a response from the credit agency and sends a message to the bank teller that states the decision.

- The bank teller sends a message to the customer that states whether the loan was approved.
- The bank manager closes the credit agency program and the customer completes the transaction.

Draw the sequence diagram for this scenario

- b) Draw Class Diagram for School information System using UML2.0 notations, by identifying advanced relationship between classes.

School has one or more Departments. Department offers one or more Subjects.

A particular subject will be offered by only one department. Department has instructors and instructors can work for one or more departments. Student can enroll in up to 5 subjects in a School. Instructors can teach up to 3 subjects.

The same subject can be taught by different instructors. Students can be enrolled in more than one school. [5]

- Q5)** a) Explain the concept of Object Constraint Language (OCL) and explain how to represents attribute and methods using OCL with example. [8]
- b) Explain the activities in View layer Macro Process and View layer micro process using an appropriate example. [8]

OR

- Q6)** a) In typical ATM system design, which classes user will interact from the View Layer, explain in detail the view layer classes for ATM system. [8]
- b) Explain the process for Designing Access Layer classes. [8]

- Q7)** a) Explain GOF Strategy and State Design Patterns. [8]
- b) Draw a class diagram and implement (write a code) Strategy Pattern for Adding two integer numbers, Subtracting two integer numbers, multiplying two integer numbers and Dividing two Integer numbers, dynamically at runtime. Consider an interface called strategy with an operation called arithmetic operation which can be implemented by respective addition, Subtraction and Multiplication and division operation classes (Strategy concrete classes) [8]

OR

Q8) a) List Nine Principles or patterns of GRASP, and explain any two using example. [8]

b) Explain client/service software architectural service pattern listed below- [8]

- i) Multiple Client/Single Service Architectural Pattern
- ii) Multiple Client/Multiple Service Architectural Pattern
- iii) Multi-tier Client/Service Architectural Pattern

Q9) Write a short note. (any three) [18]

- a) GOF Design patterns
- b) Designing concurrent and real-time software architectures
- c) Designing Software product line architectures
- d) Layered approach to software Development
- e) UML Component and Deployment Diagram

