P2094

B.E.

INFORMATION TECHNOLOGY

Object Oriented Modeling and Design

(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

1) *Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 from section I and solve Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12 from section II.*

2) *Answers to the two sections should be written in separate books.*

3) *Figures to the right indicate full marks.*

4) *Neat diagrams must be drawn wherever necessary.*

5) *Assume suitable data if necessary.*

SECTION - I

Q1) a) Explain different features of UML 2.0 with example. **[4]**

b) Why we need OCL? How to model constraints across associations in UML. **[6]**

c) Show how stereotype, tagged values, constraints can be used to extend UML through appropriate examples for modeling a 'Library Database Management System'. **[6]**

OR

Q2) a) Explain architecture of software-intensive system. **[6]**

b) What do you mean by MDA? Give the Metamodel of UML. **[6]**

c) Model the associations that a 'Student' can work on at most one 'Project' at a time but a Guide can guide more than one projects at the same time. **[4]**

Q3) a) Draw UML Use Case diagram for Canteen Management System using advanced relationships in UML. The various participants of the system are Owner, Employee, Student etc. These participants carry out certain tasks like Hire and Fire Employees, Pay Salary, Order and Fill The Stock, Keep Track of stock, Maintain Sales record, Prepare Menu Card, Prepare Rate List, Generate Bill Against Each Sale, Follow Order, Report to owner (For Stock, For Sale), Take Order, Collect Bill Amount, Place Order, Pay Bills, Cancel Order etc. **[8]**

b) Explain various uses of class diagram with appropriate example and diagram. **[8]**

OR

Q4) a) A musical company has decided to store information about musicians who perform in their albums. Each musician is identified with unique identifier. The instruments are used in songs. Song has title and an author. Each musician may play several instruments and a given instrument may be played by several musicians. Each album has exactly one musician who acts as its producer. A musician may produce several albums. Draw diagram class using advanced notations for given scenario. **[8]**

b) Can we use forward engineering in class diagram'? Explain with appropriate example. **[8]**

Q5) a) Explain following properties related to association : **[6]**

i) Qualification

ii) Association class

b) Explain with example the stereotypes that apply to dependency relationship among Packages. **[4]**

c) Draw usecase diagram for "College BE Project Management System" using advanced notations. System will help department to manage college project approval, monitoring project progress, project exam scheduling and scheduling mock presentations for projects. Students will use system to report to department and guide, view project deadlines, communicate problems to guide. Students can communicate with each other through the system. HOD can use the system to generate various departmental and university related reports for BE project. **[8]**

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OR

Q6) a) Draw the object diagram for Order Management System. **[6]**

b) Write a short note on composite structure diagram. **[6]**

c) What is multiplicity? How it is modeled in UML explain with example.
[6]

SECTION - II

Q7) a) Draw the Sequence Diagram for following scenario :

To add/purchase books in a library: Students request for a particular title. Librarian takes help of inventory to find out if sufficient book copies are available. If not, librarian consult a professor for approval of purchase of additional copies for that title. If approved librarian orders suppliers for the book copies. On arrival of book copies, the students and professors are notified. While books are being added students can/may/will issue other books if needed. Inventory is updated on arrival of book copies and payment is issued against bill by librarian. **[10]**

b) What is the purpose of Interaction Overview Diagram? Explain with suitable example and diagram. **[8]**

OR

Q8) a) What is message? Explain various types of actions in UML with example. **[10]**

b) What is the purpose of Timing diagram? Explain with example and diagram. **[8]**

Q9) a) Draw the Activity Diagram for Withdrawal of money from bank account through ATM. **[8]**

b) How exceptions are modeled in UML? Explain with suitable example.
[8]

OR

Q10) a) Draw the state diagram for CD player system explained below. The CD player contains : **[8]**

i) A drawer to hold the CD;

ii) Control interface with 3 buttons:

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1) **Load** button: the drawer will open if it was shut and will shut if it was open;

2) **Stop** button: the player will stop playing. If there is no CD, there is no effect;

3) **Play** button: the CD will be played. If the drawer is open, the drawer shuts before playing starts.

b) Draw activity diagram for 'Processing an Order' using: **[8]**

i) Fork and join

ii) Object flow

Q11) a) What is a component? What are the different types of components? How do you model the executables and libraries using components? Explain with example. **[10]**

b) How you will model Distributed system using UML. Explain with example. **[6]**

OR

Q12) a) Define the term Interface. Explain the concept of provided and required interface that a component support. Model a component 'Product' that can give us the details of the product such as description, price, and available quantity. The product component provide various services into one or more interfaces. Product Brower component needs above services to display product information. Draw component diagram using class for above system. **[6]**

b) Write short note on following: **[10]**

i) Application in UML Web applications.

ii) Pattern and framework.

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