P1164

[3864]-403

B.E. (Computer)

(Common to Information Tech.)

OBJECT ORIENTED MODELING AND DESIGN

(410443) (2003 Course)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) *Figures to the right indicate full marks.*
2) *Answers to the two sections should be written in separate answer books.*
3) *From Section I,Answer (Q1 or Q2) and (Q3 or Q4) and (Q5 or Q6). From Section II,Answer (Q7 or Q8) and (Q9 or Q10) and (Q11 or Q12).*
4) *In design questions you are encouraged to make further suitable assumptions on scope of the systems given wherever felt necessary and do state your important assumptions if any.*
5) *All diagrams/ concepts are expected inUML2.0 except stated otherwise explicitly.*

SECTION - I

Q1) Write short Notes on the following : **[18]**

a) How OMG standards XMI,MOF help in interoperability, exchange between UML tools, UML models.

b) Limitations of UML 1.3 which were overcome in UML 2.0.

c) Need for modeling, planning software systems before constructing them.

OR

Q2) Write short Notes on any three : **[18]**

a) OMG standard XMI.

b) Concepts : OO concept abstraction, iterative approach to development.

c) RUP : Rational Unified Process.

d) Architecture driven approach.

Q3) a) Why do we break large systems into subsystems. Taking an example of any large system show how packages can be used to either MODEL grouping of use cases into PACKAGES or grouping of classes/ components into packages. **[8]**

b) What changes have deployment diagrams undergone from UML1.3 to UML2.0. **[4]**

c) What are characteristics and examples of commercial database applications (Hint banking, HR etc.) Which UML diagrams are especially more suitable for commercial applications? **[4]**

OR

Q4) Consider a Scenario for an IPL cricket league system. A partial description of possible features of website follows. It is expected that many concurrent users will be performing multiple transactions like viewing players data, searching match specific details, downloading offline videos, following live scores, and buying tickets online .First Draw a PACKAGE diagram for above system. Make suitable assumptions and IDENTIFY one reusable general purpose COMPONENT for the system and give its interface/services too. Finally Draw a DEPLOYMENT diagram assuming that clients can be internet based as well as mobile based. **[16]**

Q5) a) How do UML profiles help customization of UML. **[6]**

b) With own examples explain extensibility mechanisms of UML. **[6]**

c) What is <<extends>> stereotype in UML. **[4]**

OR

Q6) a) Consider a railway reservation and enquiry system. Passengers can book tickets of different categories, look at personal ticket history, check status of reservation, check schedules, check availability, compute fares for plans. Railway authorities can add trains, decide quotas, and change stations for a route, even change train timings. Add further assumptions about the scope of application if necessary. Draw a USE CASE diagram for this description using full UML notation for use case diagrams. **[10]**

b) Write short notes on various BEHAVIOURAL diagrams. **[6]**

SECTION - II

Q7) a) Draw a CLASS diagram for a typical MOVIE rental shop. System could help in Renting returning, product catalogue, search, membership, fees collection, special offers amongst other possibilities. DVDs, VCDs can be rented. Special services like home delivery and pick up are supported too. Add your own assumptions about working of shop if necessary your class diagram must show relevant attributes, methods, relationships. **[8]**

b) How do you show ASSOCIATION relationship in class diagram, give an appropriate example, and give Notation in UML. **[4]**

c) How do you reverse engineer Java INTERFACES to UML, illustrate with examples. **[4]**

OR

Q8) In context of CLASS/OBJECT diagrams write on different ways to identify classes given below. **[16]**

a) Identifying :Entity, Controller, UI classes.

b) English statement of problem and identifying nouns.

c) Identify domain concepts as classes.

d) Identify classes using CRC method.

Q9) a) Draw a STATE diagram for the system partially described below A Train may be on a platform ready to leave, in between stations, could be arriving or leaving a station. The train could be Held in between for some reason, shunted aside for servicing etc. Consider a system that needs to report on TRAIN STATUS (for example : status as held in between stations) in real time. Make additional assumptions about scope; use advanced state diagram 2.0 features if relevant to draw the state diagram. Explain how state diagrams are related to classes and also give complete notation for STATE (entry action, etc). **[12]**

b) What are protocol state machines in UML **[4]**

OR

*Q10)*a) Draw an INTERACTION OVERVIEW Diagram for a typical college Library system. (Hint: Typical library has membership, issuing of books, returning of books, fine calculations as some example use cases with their own sequence diagrams.) Make suitable assumptions about scope. **[6]**

b) How does one model 'data/objects' in an Activity diagram, Illustrate with meaningful examples. **[4]**

c) What is the difference between 'Fork/Join and Decision Nodes'. Draw two activity diagram fragments to clearly differentiate between when to use FORK/JOIN and when to use DECISION nodes. **[6]**

*Q11)*a) Consider a use case of a "Rent a Car" .A partial description of usecase follows. Customers rent online from choice of cars. A transaction of renting car further involves aspects like source, destination, number of days car is hired, rate of hiring, etc. Payments can be done in various ways. Loyal customers with repeat business may be given discounts. Some of the likely classes are Cars, Types of cars, Rates Card, Customers, Transaction for renting the car, RentingCar a controller object, Payment, Rental GUI object to interact etc. Make additional suitable assumptions about the scope and DRAW the SEQUENCE DIAGRAMS showing actors, lifelines, objects, messages/parameters, return values, iterations. **[14]**

b) Why use sequence diagrams. **[4]**

OR

*Q12)*a) For use case "Rent A Car" described in (question number 11 a) draw a COMMUNICATION diagram. Please make additional assumptions if relevant and appropriate. First Identify classes, actors for above system and THEN DRAW a COMMUNICATION diagram for above usecase with best use of UML2 Notation. **[8]**

b) Show two different ways to model/ depict 'Iteration' in sequence diagrams, with suitable examples. **[6]**

c) In the context of interaction diagrams, with examples, explain the concept of 'Synchronous Messages'. **[4]**

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