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B.E. (Information Technology)

OBJECT ORIENTED MODELING AND DESIGN

(410443) (2003 Course)

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

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate books.***
2) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6 in Section-I and Q7 or Q8, Q9 or Q10, Q11 or Q12 in Section-II.***
3) ***Figures to the right indicate full marks.***
4) ***In design questions you are encouraged to make further suitable assumptions on scope of the systems given wherever necessary. Highlight the assumptions.***

SECTION - I

Q1) a) Explain in detail model driven architecture and its applications. **[6]**

b) What is CORBA? What are the basic elements of CORBA? Explain. **[6]**

c) Explain: **[6]**

i) Importance of XML in XMI.

ii) Minor features of Object Oriented Programming.

OR

Q2) a) What is the purpose of an Interaction diagram? Explain with suitable example the different types of Interaction diagrams in UML 2.0. **[8]**

b) Why object oriented approach is superior to procedural approach? **[6]**

c) Explain 4+1 view architecture. **[4]**

Q3) a) For a "Online Railway Reservation System". Identify the various use cases and draw the use case diagram. **[8]**

b) What is the importance of a state diagram in a Embedded application. **[4]**

c) Explain with example different types of Relationships in UML. **[4]**

OR

P.T.O.

Q4) a) Draw a class diagram fragment for a banking system with two classes. Account and customer and the relation that customer opens Account. Further the Account may be of type saving or current. Assume suitable attributes for the classes. **[8]**

b) Compare ACCESS and IMPORT stereotypes for a package diagram.**[4]**

c) What is forward Engineering of a USECASE from a USECASE diagram. **[4]**

Q5) a) Consider a marksheet class with attributes Aggregate marks, unit test marks, bonus marks and a operation calculate marks (). Also consider that there is a student class with the relationship that a student gets marksheet. Specify the following constraints in OCL. **[8]**

i) A student can get at max 80%.

ii) A class variant that the aggregate marks cannot be < 40%.

iii) A post condition for calculate marks () operation that aggregate marks are increased by bonus marks.

iv) All instances of students objects, the bonus marks should be > 10.

b) What do you understand by Instance level deployment diagram? **[4]**

c) What is CRC? Explain with example. **[4]**

OR

Q6) a) Consider a "Student Attendance System" having use cases like "View Attendance", "View Practical Attendance", "Input Student-Id", "Attendance Report" etc. Make use of use case relationships to model above usecases and their relationships in context of use case diagram.**[8]**

b) Explain in detail different types of advance Relationships by giving suitable example. **[8]**

SECTION - II

Q7) a) Draw a class diagram for a College Library. Make suitable assumptions regarding the scope and functionality of the system. **[12]**

b) What is the need of composite structure diagram. **[4]**

OR

Q8) a) A Experts group guides the students in their institute. The guidance is given for two activities namely "Programming Skills" and "Communication Skills". The Experts are specialized in either activity. The sessions on specific topics in specific activity are announced and the students need to register for the session. Assume suitable classes, attributes, operations and relationships that may exist between them and draw an object diagram showing clearly the attributes and relationship details. **[12]**

b) What is a Event? Explain with example different types of Events. **[4]**

Q9) a) Explain the concepts and notations through simple examples for following terms in UML: **[8]**

i) Concurrent States.

ii) Substate.

iii) History State.

iv) Exceptions in activity diagram.

b) Model a software system for controlling a water purifier which can be either ON or OFF. In the ON state it can be in ARO or UV mode. There are buttons to change from one mode to other or this mode can change automatically based on the hardness of the water cutoffs. (ARO when pH value < 1.5 and UV when pH value > 1.5). User can manually override any modes through by pressing appropriate buttons. All the buttons function only if power is on. For the above described system draw state machine diagram. **[8]**

OR

Q10) a) Explain the concepts and notations through simple examples for following terms used for activity diagram: **[8]**

i) Action states.

ii) Activity states.

iii) Transitions.

iv) Fork and Join.

b) Draw an activity diagram to explain the way one would create a presentation for a seminar using power Point. Show the activities that are optional. **[8]**

Q11) a) Draw a communication diagram for a "schedule of one day workshop" in the Information Technology department of a Engineering Institute organized for the students of Final year. Make assumptions of possible classes. **[8]**

b) Compare synchronous and Asynchronous messages. **[6]**

c) How does one model parallel message flows in a sequence diagram.**[4]**

OR

Q12) a) What is recursion? How do we represent recursion in a sequence diagram? Consider a suitable example and draw a complete sequence diagram. **[8]**

b) Consider a online webbased "Computer Rental System". Draw a sequence diagram for "Rent a computer" use case with the following assumptions. The customer needs to first select the type of computer he wants to rent. The computer system database is maintained in the system organized in to types like: Desktop, Laptop, Notepad, Pocket PC etc. Based on the availability of the computer system, the rates of rent are displayed, the booking is done, confirmed, the booking details are stored and the customer is issued an electronic confirmation of the booking. **[10]**

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