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B.E. (Computer + IT) (Common)

OBJECT ORIENTED MODELING AND DESIGN

(410443) (2003 Course) sem 1

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

Instructions to the candidates:

1) ***Figures to right indicate full marks.***
2) ***Answers to two sections should be written in separate answer books.***
3) ***From section-I, answer (Q 1 or Q2) and (Q 3 or Q 4) and (Q5 or Q 6).***
4) ***From section-II, answer (Q 7 or Q8) and (Q 9 or Q 10) and (Q 11 or Q 12).***
5) ***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.***

SECTION - I

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

a) OMG and its role in defining standards.

b) UML versions.

c) Object Oriented concept inheritance and how to model it in UML/C++.

OR

Q2) a) Write short notes on CORBA.

b) Illustrate the new (only) UML 2.0 features introduced in activity diagrams.

c) What activities are carried out in construction phase of RUP. **[18]**

Q3) a) What is understood by software architecture, what do you understand by subsystems and components the two important architectural elements and in which diagrams and how are they modeled in UML? Illustrate using diagrams. **[8]**

b) What are the different type of components in UML 1.3 **[4]**

c) How does one forward engineer a component? Illustrate. **[4]**

OR

Q4) a) With an example system of your choice explain and illustrate full notation of a deployment diagram with examples. **[8]**

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b) Explain the concept of package in package diagram. **[4]**

c) How do you show package generalization in UML, illustrate with appropriate example? **[4]**

Q5) a) Why do we need OCL and how does one model a constraint on class attributes in OCL. **[6]**

b) What do you understand by <<bind>>, <<trace>> stereotypes in class diagrams? **[6]**

c) What are TAGS in UML, give examples? **[4]**

OR

Q6) a) Consider a LIBRARY PURCHASE system described below. We can use the system to manage library's books purchasing from suppliers. System can also manage member's demand for new titles they wish the library to possess. The system also has to manage suppliers, payments, ordering and cataloguing of books on arrival. 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. **[6]**

b) What do you understand by concepts of stereotypes, meta models? **[6]**

c) What is the need for a state diagram, what aspects does it help model? **[4]**

SECTION - II

Q7) a) Draw a class diagram for a FILE MANAGEMENT SYSTEM (FMS). Make suitable additional assumptions about scope and working of your system (write down the scope too). The FMS has concepts of directories, subdirectories, Files. FMS keeps information on directories as well as files for example of creation date, size of file, entries in a directory etc. One also needs operations to move, delete, create etc. Your classdiagram must show relevant attributes, methods, relationships. **[8]**

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

c) How do you forward engineer a CLASS in C++. **[4]**

OR

Q8) In context of CLASS/OBJECT diagrams what do you understand and how do you model the given terms/concepts. **[16]**

a) Entity class.

b) LINK.

c) Aggregation.

d) Utility Class.

Q9) a) Draw an activity diagram for the business process described below : **[12]**

A student applies for admission to a college. He can join one of the engineering branches. The student applications are sorted on merit. Top students are offered the admission on merit order. The joining process involves student being shown available branches. Student selects a branch, chooses optionally a hostel seat, in parallel makes payments, selects memberships to gym, and selects elective courses to attend. On successful admission he is enrolled, given a admit card, and is given a copy of academic calendar. The students not admitted can register their interest in waitlist. Make additional assumptions about scope, use advanced activity diagram 2.0 features if relevant.

b) Compare activity diagrams in UML 1.3 and UML 2.0. **[4]**

OR

Q10) a) Draw neat fragments on one of the (/interaction overview/state/ activity) diagrams to represent the following. Explain the concept too. **[12]**

i) Entry and exit actions of a state.

ii) Activity with in / out pins.

iii) Interaction overview diagram.

b) How does one model multidimensional swim lanes in an activity diagram **[4]**

Q11) a) Consider a use case of a banking system for "Adding Interest to all savings accounts" for this draw a SEQUENCE diagram. A brief description is given here. The interaction is triggered at last day of each month 12 noon. The 'interest rates object' is checked for latest interest rates, for each account the status of account is checked. If account status is operational, the account balance is obtained. Interest is calculated and the added to account and the resultant sum is updated as balance of account. The entry is also recorded in a 'log object'. Once all accounts are updated the log entries are printed one after other. The log object is then destroyed. Administrator is notified of completion of operation on his screen. Make additional suitable assumptions about the scope and draw the sequence diagram showing actors, lifelines, objects, messages/parameters, return values, iterations. **[14]**

b) When is sequence diagram used in software life cycle, Justify. **[4]**

OR

Q12) a) Consider a Use Case "Add an employee to a PROJECT". The possible actor in the system is HR Manager. The HR manager interacts with the GUI to choose the employee from existing employees list to be added. A list of projects is shown to choose from too. The employee record is also separated updated, as well as the employee is added to the project, and the employee is informed about his addition to project by email. Please make additional assumptions if relevant and appropriate. Identify classes, actors and model a COMMUNICATION diagram for above system with best use of UML Notation. **[8]**

b) Draw a simple SEQUENCE diagram fragment for a system/example of your own to show good use of a 'parallel' fragment. **[6]**

c) In the context of interaction diagrams with examples explain the concept of controller objects. **[4]**