

OLLSCOIL NA hÉIREANN, GAILLIMH
THE NATIONAL UNIVERSITY OF IRELAND, GALWAY

SEMESTER II EXAMINATIONS 2001

Higher Diploma in Software Design and Development

CT859: OBJECT ORIENTED DESIGN

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Time allowed: TWO hours

Answer both parts of question **ONE** and any **two** other questions of your choice
All questions carry equal marks

1. Construct a Class Diagram for the order processing system described below.

- Each order consists of one or more order lines.
- Each order line corresponds to a particular product item. Each order line has an item description, price, quantity and a field that indicates the status of this entry.
- Each product item can appear on multiple orders.
- The status of an order line can be either *filled* (sufficient quantities of the item are in stock), *on-order* (extra stock must be ordered to fulfill the order) or *cancelled*.
- The status of an order can be *pending* (initial state, while stock levels are being checked), *filled* (the order has been packaged ready for shipping), *shipped* (received by the customer but not paid), *closed* (the customer has received the goods and paid the amount due), or *cancelled*.
- An order can not be *filled* until all it's order lines have the status *filled*.
- A customer can place many orders, but each order belongs to only one customer.
- Each order has an order number, date and customer number.
- Customers can be either businesses or individuals.
- All customers have a name and address. Business customers also have a contact name, credit rating and available credit.
- Individual customers may have a credit card number on file.
- You need to be able to ship, cancel or generate a bill for an order.

(30)

2. Write notes on three of the following, using examples to illustrate your answer:

Scenarios
 Generalisation
 The noun identification technique
 Multiplicity
 Constraints

(30)

3. (a) A simple system is to be developed to support the management of assignments completed by students taking a course. Students first meet with the course tutor to register for the course. During the course they submit a number of assignments. At any point, a student can find out from the system the marks they have received for any assignments they have handed up. The course tutor can enter a mark for each assignment for each student. The tutor can also print out individual marks for students by assignment. The tutor can also print out a summary of the marks gained by all students on a particular assignment or on all assignments.

Describe suitable use cases, and draw a use case diagram for this system

(30)

4. Using an example, explain the use of the following terms in Activity Diagrams

- guard expression
- swimlane
- branch
- concurrent fork
- action state
- concurrent join

(30)

5. (a) Draw a state transition diagram for the order class described in Question 1.

(20)

- (b) Write notes on the following, using examples to illustrate your responses:

- Guard Conditions
- Event triggers with parameters
- Entry and exit actions

(10)

6. (a) Describe, using suitable examples, the following terms relating to Sequence Diagrams:

- Focus of control
- Lifelines and creation / deletion of objects
- Timing constraints

(10)

(b) Draw an interaction diagram to support the order processing system described in Question 1 (you may need to identify one use case from the overall description).

(20)