



INFORMATICS

OXFORD BROOKES UNIVERSITY
BACHELOR OF SCIENCE (HONOURS)

AUGUST 2006 EXAMINATION

18th AUGUST 2006

M8748: INFORMATION SYSTEMS ANALYSIS AND DESIGN

TIME : 2 Hours + 10 Minutes Reading

NUMBER OF PAGES : 1 Cover Sheet and 5 Pages of Questions

☞ **INSTRUCTIONS:**

- All Questions in SECTION A are COMPULSORY and choose any TWO questions in SECTION B.**
- Section A carries 40 marks.
- All questions in Section B carry 30 marks each.
- Please start every question on a new page.
- Answers will not be marked if they are illegible.
- Enter the question numbers (in the order you have attempted) in the boxes provided in the answer script.
- Write your **INDEX NUMBER** and **MODULE NUMBER** on the cover page of the answer script.

SECTION A

(Answer ALL questions)

QUESTION 1

A college offers a number of degrees. Each degree is composed of a number of topic modules (or courses depending upon which part of the world you live in). Not all degrees are made up from the same number of modules. Each degree has a unique name, and each module has a unique name.

The grade for a module will be based on a weighted combination of an exam mark and a coursework mark. The weight given to each of these grade components can differ from one module to the next, and is part of the defining characteristics of a module.

When a student registers for a college degree it is necessary to store such information as the name of the student, and the name of the degree for which the student is registering. You must also be able to add the results for the student for each of the modules in the registered degree.

We want to eventually create a system that will let us define, update and report on various students' degrees of study.

- a) Use use case notations to depict the requirements of a system that defines, updates and reports on various students' degrees of study for the college.

[10 marks]

- b) Using the noun analysis technique discover a number of suitable classes from the description of each use case drawn in part (a).

[10 marks]

- c) Use UML diagrams to document the attributes and methods of classes listed in your answers for part (b).

[20 marks]

[TOTAL FOR QUESTION 1: 40 MARKS]

SECTION B
(Answer any TWO Questions)

QUESTION 2

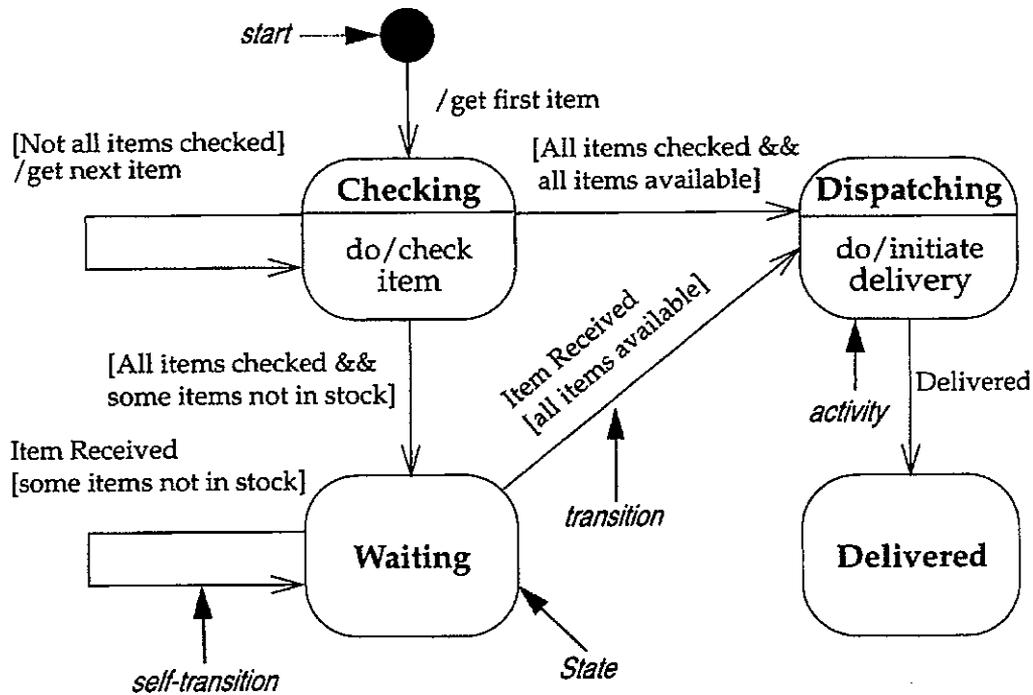
During the initial analysis of an information system for a school, the following classes seemed to be appropriate - *School, Department, Student, Course* and *Instructor*.

- a) Use CRC cards to establish the responsibilities and collaborators for these classes. **[10 marks]**
- b) Draw a UML class diagram showing the relationships between these classes. **[10 marks]**
- c) What are the purposes of drawing class diagrams? **[4 marks]**
- d) Use UML notation to show the relationship between:
- i) A Polygon class and a Side class;
 - ii) A Company and an Employee;
 - iii) A Company and its Departments.
- [6 marks]**

[TOTAL FOR QUESTION 2: 30 MARKS]

QUESTION 3

- a) The following is the state diagram showing the various states for an order object in an order processing system. Apply walk-through technique to perform static testing of the diagram using the following scenarios as test cases.

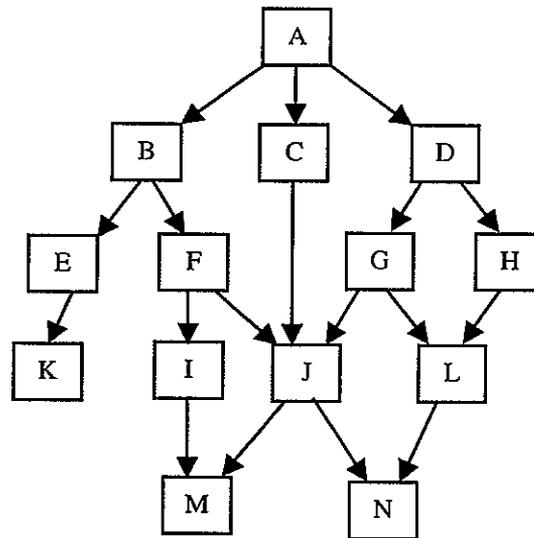


- Scenario 1: There is 1 item in the order list, and the item is available.
- Scenario 2: There is 1 item in the order list, but the item is not available.
- Scenario 3: There are 2 items in the order list; the first is available, but the second is not available.
- Scenario 4: There are 2 items in the order list, the first is not available, but the second is available.
- Scenario 5: There are 2 items in the order list; both of them are not available.
- Scenario 6: There are 0 item in the order list.
- Scenario 7: There are 3 items in the order list; none of them are available.

The walkthrough must identify **State, Event, Condition, Action** and **New State** - preferably in a table format for the above scenario.

[10 marks]

- b) Given the following module interdependence relationship, describe the top-down and bottom-up integration process respectively.



[10 marks]

- c) Briefly describe five important underlying causes of problems in information systems development?

[10 marks]

[TOTAL FOR QUESTION 3: 30 MARKS]

QUESTION 4

- a) Consider a scenario of Insurance company, where
- Customers sign Insurance policy
 - Customer can have 1 or more than policy
 - Insurance sales person prepare the Insurance contract for the customer
 - Process monthly sales statistics as well as customer statistics.

A use-case diagram shows actors, use cases, and their relationships. The system is defined through system boundaries.

Use appropriate graphical notations to depict the requirements. Draw a Case diagram for the above scenario. [Correct annotations should be applied].

[8 marks]

- b) Compare between validation and verification in software testing.

[8 marks]

- c) Define the reason, when to use V model? Describe the disadvantages of Prototyping.

[10 marks]

- d) What do you understand by “Static” and “Dynamic” testing method?

[4 marks]

[TOTAL FOR QUESTION 4: 30 MARKS]

- END OF PAPER -