



OXFORD BROOKES UNIVERSITY

BACHELOR OF SCIENCE (HONOURS)

APRIL 2006 EXAMINATION

21ST APRIL 2006

M8748: Information Systems Analysis and Design

TIME : 2 Hours + 10 Minutes Reading

NUMBER OF PAGES : 1 Cover sheet and 4 Pages of questions

Φ **INSTRUCTIONS:**

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

SECTION A

(Answer ALL questions)

QUESTION 1

(a) Here is a scenario of a Elevator. The operations goes like this: -

The elevator starts at the first floor. It can be moving up or down. If the elevator is idle on one floor, a time-out event occurs after a period of time and moves the elevator back to the first floor.

Note: This State diagram does not have an end point (final state).

Draw a State diagram based on above scenario.

[7 marks]

(b) Prepare a State diagram for the above scenario (Qn 1a) with Zero timing or idle state.

The Idle state assigns zero to the attribute timer, then it increases the timer continuously until the event go down or go up occurs or until the guard-condition timer = time-out becomes true.

Note: This state diagram does not have an end point (final state).

[13 marks]

(c) As we know, The Digital watch has mode button to set or change the time. The Digital watch class diagram shows how events in the state diagram are related to operations within the class. The watch has three states: its normal display state showing the time, and two states for setting the clock (hours and minutes, respectively).

Draw a Class diagram and State diagram.

[10 marks]

Note: Students need to draw one class diagram, which points to the state diagram of the above scenario.

- (d) Printing documents basically involves sending the electronic documents from computer to Printer Server and then to the Printer. If the printer is free, the documents should be printed or it should be stored in the queue if the printer is busy for later printing. The printing status should be reflected to the computer.

[7 marks]

Use appropriate graphical notations to depict the requirements the system. (Required to draw Sequence diagram).

- (e) Booting computer follows of series of tasks and loading of software before it is ready to use by end user. Draw a state diagram that shows the states from booting computer to loading applications until it is ready for end user to use.

[3 marks]

Use appropriate graphical notations to depict the requirements the system. (Required to draw State diagram). [Students need to identify only 3 states only]

[TOTAL MARKS FOR QUESTION 1: 40 MARKS]

Section B

(Answer any **TWO** Questions)

QUESTION 2

Here is a scenario of an alarm activation system. Most messages are sent asynchronously for alarm activation. The alarm system has following component : cell handler, system handler, cell configuration information and each components have their own role to play. The Cell Configuration information component contain configuration data or information. The alarm activation follows this way : System Handler gives an order to the next component as a input to the Cell Handler to activate the alarm itself then the Cell Handler activate the alarm. At the same time The Cell Handler also sends able to send self-test signals to all devices, to acknowledge that they are working correctly for checking the working condition of the alarm system. The sensor devices also need an activate signal as a input to become activated the alarm.

- (a) Draw a Sequence diagram for the above scenario. [Correct annotations should be applied]

[10 marks]

- (b) A sensor has detected a movement and initiates an alarm in the system.

Draw a Collaboration diagram. [Correct annotations should be applied].

[15 marks]

- (c) A Person or a Company can have zero or more Insurance Contracts. A contract can be owned by one or many Persons or by one or many Companies. Draw a class diagram which shows the relationship or association with Insurance company, insurance contract, company and person.

Draw a Class diagram. [Correct annotations should be applied].

[5 marks]

[TOTAL MARKS FOR QUESTION 2: 30 MARKS]

QUESTION 3

- a) ABC warehouse Pte Ltd is a warehouse storage and order processing company who sells hardware materials. It store materials in warehouse, receives the order from the customers and process it sends it to customers and also bills to customers. Customers have to receive the order send pay to the company. Draw an activity diagram showing the various states of the order processing system (customer, sales, warehouse) from the above scenario.

[Correct annotations should be applied].

[20 marks]

- b) State some of problems of using prototyping. [10 marks]

[TOTAL MARKS 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].

[3 marks]

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

[13 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 MARKS FOR QUESTION 4: 30 MARKS]

- END OF PAPER -