



OXFORD BROOKES UNIVERSITY

BACHELOR OF SCIENCE (HONS) COMPUTING
AND INFORMATION SYSTEMS

AUGUST 2004 EXAMINATION

20 AUGUST 2004

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) Here is a scenario of building a house. The stages are goes like this: -

Description: The steps of building are as follows: firstly, you select a site. Next, you commission an architect to design your house. After you've settled on the plan, your developer asks for bids to price the house. Once you agree on a price and a plan, either construction can begin or trade works start means purchased of building materials. Permits are secured, ground is broken, the foundation is poured, the framing is erected, and so on, until everything is done and finish construction.

Draw a activity diagram based on above scenario, from select a site until the steps of construction. [7 Marks]

(b) ECG (Electro cardio gram) is a machine which take heart beat from patient and display on the screen or in the chart as a wave form. If there are no heart beat, the wave became flat on the screen or on the chart which indicates patient is not alive or no heart beat. The machine display can be situated beside the patient or alternate display can be situated at remote locations whereby a nurse or hospital personnel can monitor the chart. The machine have process alarm and calibrate sensors. The service personnel maintain the ECG system and update the software and do the other maintenance.

Prepare a Use Case diagram for the above scenario with ECG (electro cardiogram). [Correct annotations should be applied]. [13 Marks]

(c) A vehicle rental company rent the cars to anyone who wishes to rent the cars at any time. Customers can wish or placing their order to rent the car by choosing vehicle type and how long they like to rent. Once their wish is finalised or match their requirements then they reserve the car. After reservation s customers either cancel the rental (due to other circumstances) or they can confirmed the rental. After confirmed then key is hand over to them.

Draw a State diagram for rental a vehicle. [10 Marks]

- (d) A publishing company print, publish, circulate magazine. The peoples task are involved analysing, circulating, registering and archiving magazines. The people are involved such as are , librarian, analyser, secretariat etc. You are required to draw a Use Case to depict the above business process.

Use appropriate graphical notations to depict the requirements the system.

(Require to draw Sequence diagram)

[7 Marks]

- (e) State three strength of the functional analysis.

[3 Marks]

[TOTAL FOR QUESTION 1: 40 MARKS]

SECTION B

(Answer any TWO Questions)

QUESTION 2

Consider the following example.

- A college offers a number of degrees.
- Each degree is composed of a number of topic modules.
- 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 Degree class would contain information about the name of the degree, and the modules that comprise the degree. A Module class should contain the name of the module, and information about the assessment ratio between the weight of the examination mark and the weight of the coursework mark. If StudentProgram, representing a student's "program" of study, can be regarded as another candidate class, then in addition to its constructor we might want methods to get the name of the student; get the degree on which the student is registered; add the results of an assessment for a module to the class; and get the results of those modules that have been examined. the ModuleResults class contains methods to get the name of the module; get the exam mark; get the coursework mark; get the total mark; and get the grade based upon the total mark.

- (a) Draw a Class diagram for the above scenario. [Correct annotations should be applied] [20 Marks]
- (b) What do you understand the term "Overriding the superclass" [5 Marks]
- (c) What do you understand by th term of "Polymorphism" with examples. [5 Marks]

[TOTAL FOR QUESTION 2: 30 MARKS]

QUESTION 3

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. Potential passengers may press the button to request the elevator while it is occupied by other passengers. Passenger can hold open door, take a ride and other passengers may request elevator if are waited other floor. Controller personnel can perform some functions like handle cable break, can unstuck elevator etc.

(Require to Use Case diagram. Correct annotations should be applied) [10 Marks]

b) The operations of elevator: - The elevator starts at the first floor. It can be moving up or down. Potential passengers may press the button to request the elevator while it is occupied by other passengers. Passenger can hold open door, take a ride and other passengers may request elevator if are waited other floor. Passengers may press button to request elevator no matter which floor they are. The lift operates between 1st floor to 8th floor. Any passengers may use the elevator and alight in between any floor, even though the elevator may occupied by other passengers. For example, those passengers waiting at 1or 2nd floors can press btton for UP lift service. Once the lift reach 8th floor, it automatically come down 1st floor and when it is coming down, it can stop different floor so that passengers from lower floor can take lift and can reach 1st floor.

Draw a Sequence diagram for the above Elevator scenario. Above functional description can be used to draw the sequeence diagram.

[15 Marks]

c) Following activities can be carried out in the mail order processing in a company, such as article reservation, ordering, order positin, article stock etc. Article can be reserved in stock in corresponding order, new article order can be split into article number (article serial no)etc.

Draw a Sequence diagram for a mail order articale processing
[Correct annotations should be applied].

[5 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]. [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 FOR QUESTION 4: 30 MARKS]

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