



OXFORD BROOKES UNIVERSITY

BACHELOR OF SCIENCE (HONS) COMPUTING
AND INFORMATION SYSTEMS

DECEMBER 2003 EXAMINATION

12th DECEMBER 2003

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 in this section)

Question 1

- (a) Here is a scenario of a washing machine. Assuming you have completed "add clothes", "add detergent", and "turn on" operations, the sequence of steps goes something like this: -
- Water enters the drum via the water pipe
 - The drum remains stationary for five minutes
 - Water stops entering
 - The drum rotates back and forth for fifteen minutes
 - Soapy water leaves via the drain
 - Water entry starts
 - The drum continues rotating back and forth
 - Water entry stops
 - Rinse water exits via the drain
 - The drum rotation becomes one-directional and increase in speed for five minutes
 - The drum rotation stops and the wash is done

Above scenario and sequence capture the interactions among the water supply, drum, and drain. Draw a sequence diagram based on above scenario.

[14 marks]

- (b) Prepare a collaboration diagram for the above scenario. [Correct annotations should be applied].

[6 marks]

- (c) Inheritance is a characteristic in Object Oriented programming. What do you understand by Inheritance? Define their benefits as well.

[10 marks]

Question 1 continues on next page - Please turn over

- (d) Consider a scenario of a creating a model of a shirt and how it fits into an outfit and a Wardrobe. The following class you may consider: -

- Sleeve
- Body
- Button system
- Buttonhole
- Button
- Collar

Use appropriate graphical notations to depict the requirements of a system that defines the above scenario. (required to draw a class diagram).

[10 marks]

[TOTAL: 40 MARKS]

Please turn over

SECTION B

(Answer any **TWO** questions in this section)

Question 2

Consider a scenario of a buying soda from a soda machine (soda vending machine), where customer buys soda, supplier's restock the soda into the machine; collectors collect the soda (which could be customers himself or his companion).

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

[10 marks]

- (b) Draw a Case diagram for the above scenario "with inclusion of USE CASE". [Correct annotations should be applied]

[10 marks]

- (c) Informatics IT (Information Technology) Consultancy Pte Ltd, run IT (information Technology) projects in Singapore and Hong Kong. It has 30 consultants. The job of the consultants are as follows:

- Consultant works on project and he serves to client.
- Consultant writes proposal and pass to client to view and read it.
- Consultant represents the company and writes the report for client as well as for project with data.
- Consultant's proposal, lead to a project and he also writes project report based on project proposal data (customer requirements) and presented to clients. Reports contain project data.

Draw a class diagram with relationship for the above scenario.

Note: Class should include Project, Client, Consultant, Proposal etc.

(Required to draw a class diagram). [Correct annotations should be applied].

[10 marks]

[TOTAL: 30 MARKS]

Please turn over

Question 3

ABC Restaurant is a restaurant where customers walk in and dine in and the menu consists of appetizer to main course and to dessert. Since this restaurant is located inside a 6 star hotel in side the business district area, so the customers are walking in are normally high professional working people. Customers walk in leave their coat and hat, have their meals and take their coat/hat and leave. [Correct annotations should be applied].

Draw an activity diagram for the restaurant business processing system based on above scenario.

[30 marks]

[TOTAL: 30 MARKS]

Question 4

(a) Consider a scenario of a buying soda for the incorrect-amount-of-money that the customers put into the vending machine and out-of-selection of desires soda from a soda machine (soda vending machine), where customer buys soda, supplier's restock the soda into the machine, collectors collect the soda (which could be customers himself or his companion). For the putting incorrect-amount-of-money and out-of-selection of the Sodas scenario are details: -

- The register checks to see whether the customers input amount matches the price of the soda.
- If the amount is greater than the price, the register calculates the difference and checks its cash reserve.
- If the difference is present in the cash reserve, the register returns the change to the customers and everything proceed as before
- If the difference is not in the reserve, the register returns the input amount and displays a message that prompt the customers for the correct amount
- If the amount is less than the price, the register does nothing and the machine waits for more money.
- After the customer selects a sold out brand, the machine flashes a "sold out" messages.
- The machine displays a message that prompts the customers to make another selection.
- The customer has the option of pushing button that returns his/her money.
- If the customer selects an in-stock brand, everything proceeds as in the best-case scenario if the input amount is correct.

Draw a class diagram based on above scenario.

[14 marks]

Question 4 continues on next page - Please turn over

(b) Draw a collaboration diagram as a best-case of buying Soda from vending machine.

The scenario as follows: -

- The customers insert the money into the money slot in front of the machine.
- The customer makes a selection.
- The money travels to the register.
- Since this the best scenario, assume the soda is in stock, and the register updates its cash reserve.
- The register has the dispenser deliver the soda to the front of the machine.

Draw a collaboration diagram for the above scenario as a best-case. [Correct annotations should be applied].

[6 marks]

(c) Draw a collaboration diagram for putting incorrect-amount-of-money in the vending machine by customer. Scenario based on the Q4(a).

Use appropriate graphical notations to depict the requirements of a system that shows that customers putting in correct-amount-of-money in the vending machine. (Required to draw collaboration diagram). [Correct annotations should be applied].

[10 marks]

[TOTAL: 30 MARKS]

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