NORTH-WEST UNIVERSITY
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VAALDRIEHOEKKAMPUS

EXAMINATION:	**First Opportunity Nov 2016**	**QUALIFICATION:**	**B.Sc.(IT)**
MODULE CODE:	**ITRW225**	**DURATION:**	**3 Hours**
SUBJECT:	**Systems Analysis & Design II**	**MAX MARKS:**	**100**
EXAMINER(S):	**Imelda Smit**	**DATE:**	**31/10/2016**
MODERATOR(S):	**Prof Roelien Goede**	**TIME:**	**9:00**

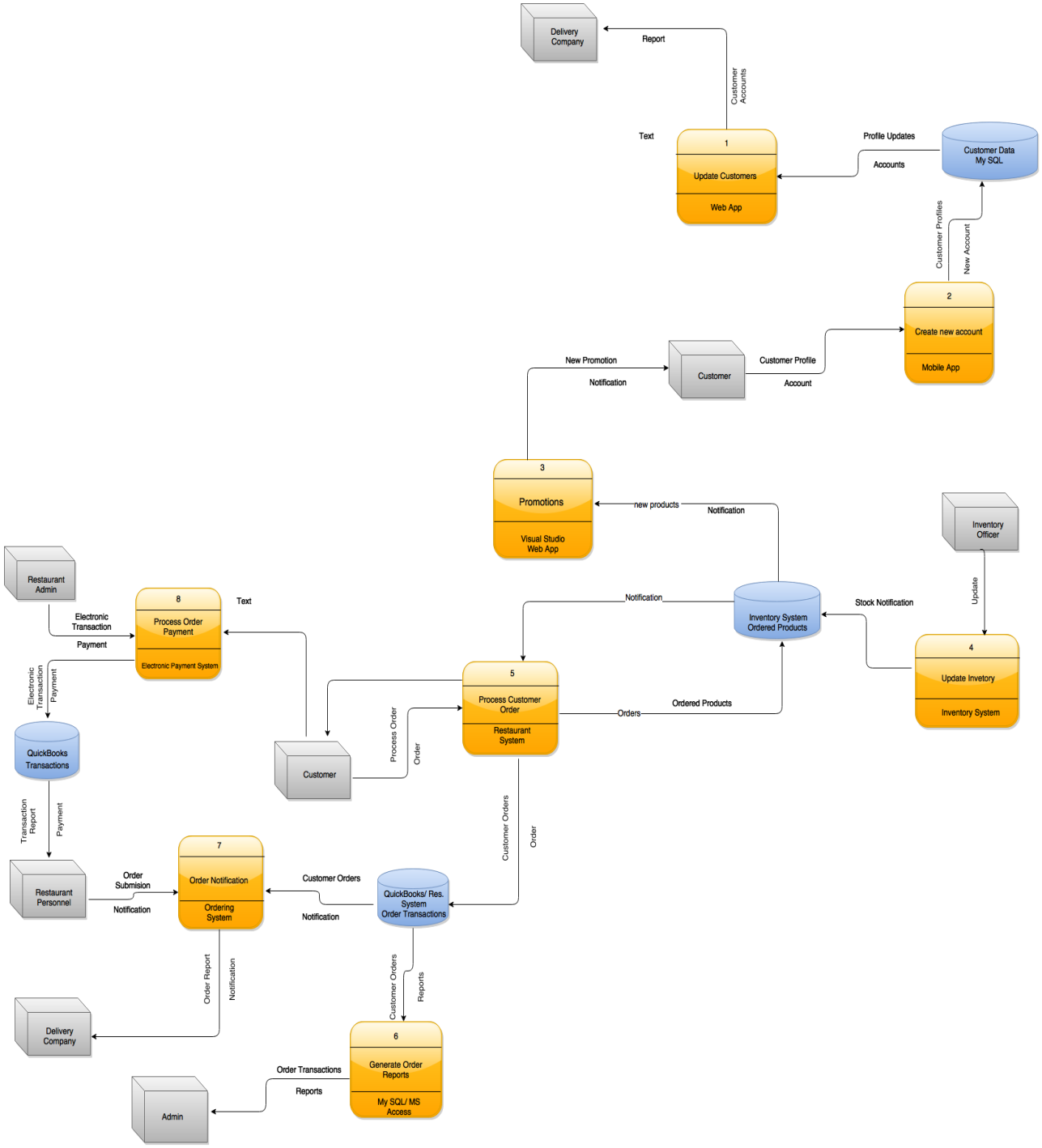
Answer all the questions.

Question 1 < SYSTEMS DESIGN > [7]

Upon receiving approval from the steering committee for the in-house development of a proposed system, the analysed system is referred to when completing its design.

Name the **five general design steps** to be followed. Also indicate the **analysis document(s)** stored in the project repository that would be relevant to each task, as well as the **document(s) to be stored in the project repository upon completion of a task**.

Question 2 <APPLICATION ARCHITECTURE & MODELLING [23]



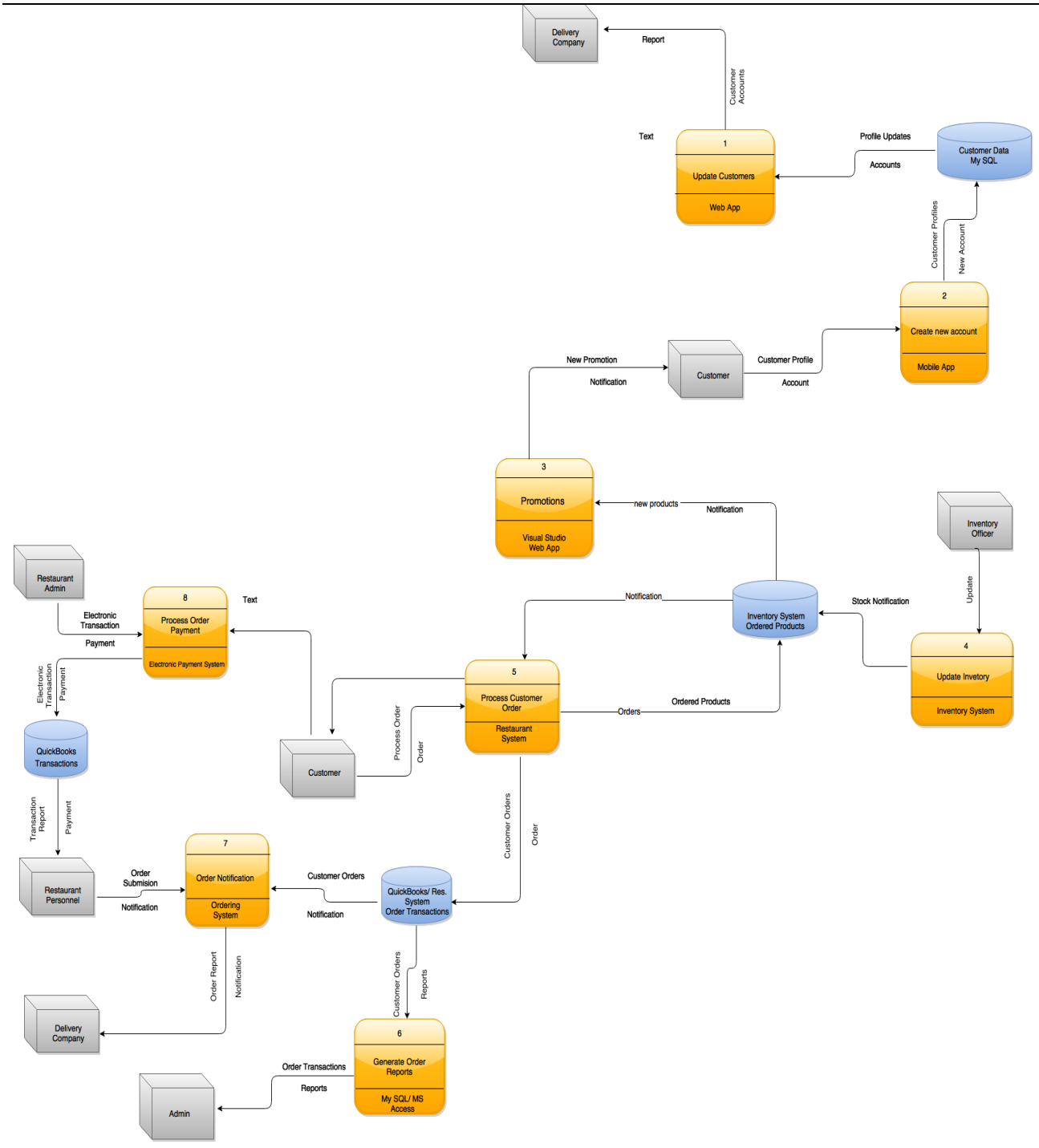
2.1 Use the checklist supplied in Addendum A attached to the end of this paper to **identify three types of mistakes on the physical DFD** given. Give at least **one example of each type of mistake**. **Explain how each mistake may be corrected.** You may use the answer sheet provided on the next page to help you to identify mistakes on the physical DFD. 9

2.2 **Add any one item to the checklist shown. Show the check list item visually.** 3

2.3 When you started your project at the beginning of the year, you were advised to create an intranet project Web site (referred to as the project repository in question 1) to serve as a community portal to all non-sensitive news and documentation concerning your project. Draw a **physical DFD** to **show the processing needed to manage this Web site**. Also indicate the **person-machine boundary**. 11

Student name:

Student number:

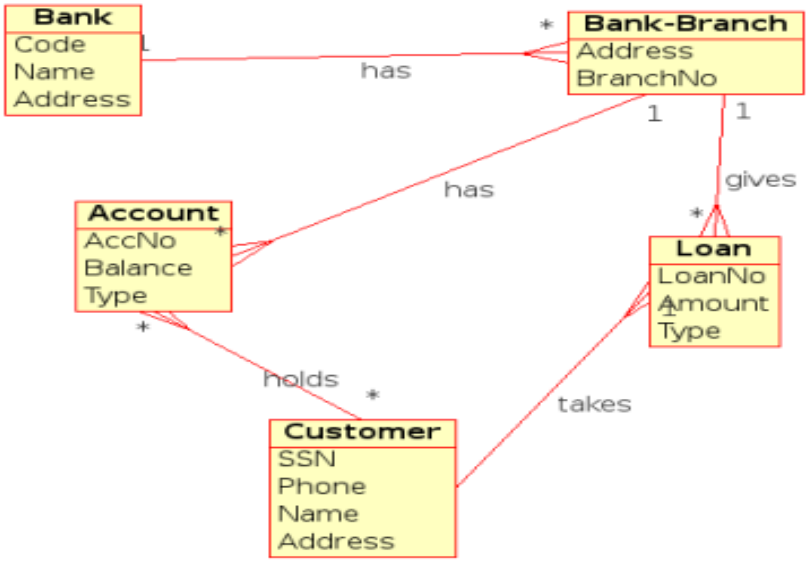


Type of mistake	Example	Corrected

Question 3 < DATABASE DESIGN > [16]

3.1 Draw the **data architecture** for the system you did for your group project. Identify those **files and/or databases that may be utilised in typical data architecture, but did not form part of your group project's system**. **Motivate why these files/databases were not used in your context.** 8

Study the logical BANK ERD before answering the question:



3.2 Draw a **physical ERD** of the given model. Also indicate the implementation of **referential integrity (delete)**. 8

Question 4 < GUI > [20]

Among GUI styles we find menu-driven and instruction-driven interfaces, as well as question-answer dialogues. Mnemonic syntax is one of three types of instruction-driven interfaces.

4.1 **List, explain, and supply an example** of the **other two instruction-driven interfaces**. 4

4.2 What does the **mnemonic syntax** mean? 1

4.3 Supply **three types of general mnemonic uses** or applications with an example of each. 3

4.4 Explain **how mnemonic syntax is applicable to your group project**. If you have used mnemonic syntax in your group project, describe how it was used. Make drawings if necessary. 4

4.5 Supply the **input taxonomy for your group project**. 8

Question 5 <IMPLEMENTATION & MAINTENANCE> [14]

5.1 Which **repositories | libraries | databases** are of crucial importance during systems construction and implementation & systems operations and support? Explain the **use of each repository | library | database**. List **the stakeholder(s) relying on each repository | library | database**. 8

5.2 Compile a checklist for your system's **office | web | mobile app** (*choose one*) **GUI guidelines**. 6

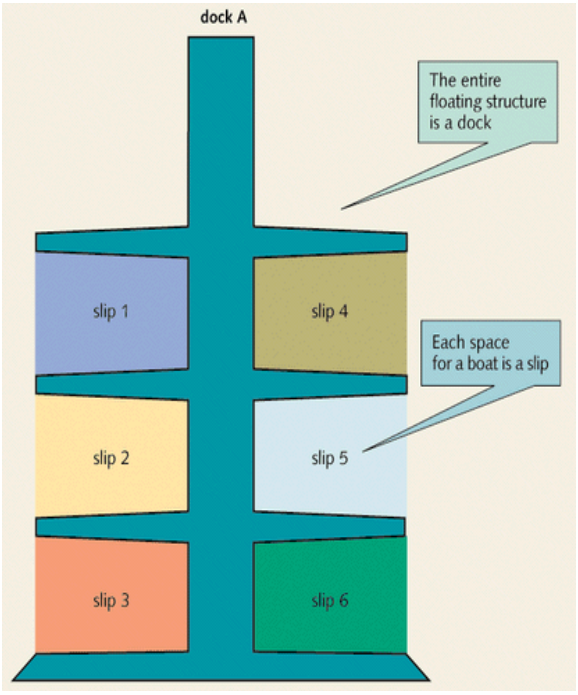
Question 6 < OBJECT ORIENTED ANALYSIS & DESIGN> [20]

Carefully read the case study before answering the questions:

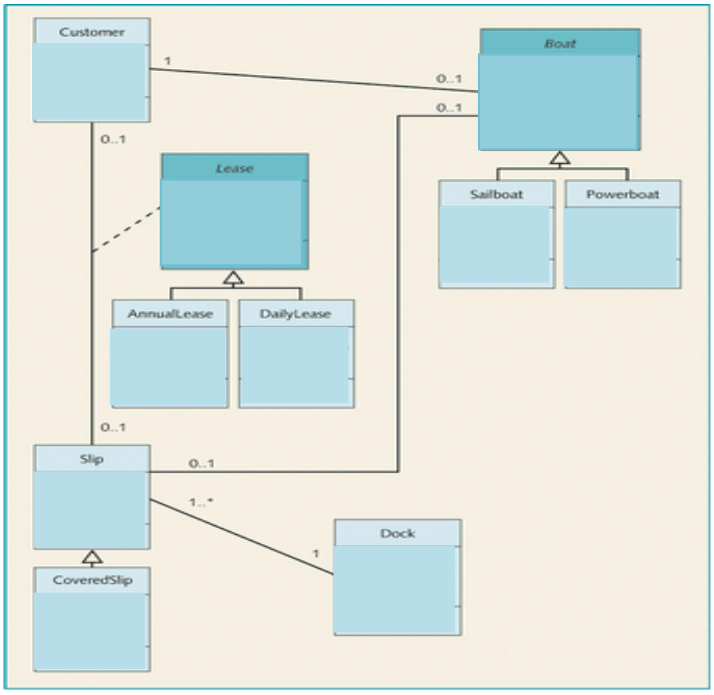
Vaal Marina Case Study

The Vaal Marina is in need of a computer system.

Vaal Marina is a privately owned corporation that rents boat slips and provides boat services on the Vaal Dam. They would like to have an automated system to track their customers, the slips they lease, and the boats in the slips. Initially, the system will simply maintain basic information for customers (customer's name, address and contact details), slips (sizes may differ), and boats (the size of the boat, its manufacturer, and year it was manufactured; also no boat that is not registered would be accommodated), and perform day-to-day business tasks. Vaal Marina eventually wants to enhance the system so that they can add boat service records. Later, they want to add billing features to the system. They want to be able to use the system to generate bills for both slip leases and boat services, record payments, send late notices, and produce accounts receivable and other accounting reports. The picture to the right shows a dock containing slips.



The class diagram has been partially developed by the analyst:



6.1 Draw an **activity diagram** for the scenario: ***Lease annual slip to existing customer***. Do this according to your understanding of the scenario. 8

6.2 Draw a **design class diagram** based on the information supplied to you. 12

ADDENDUM A: DFD Checklist

Did you revise your logical DFD? ☐

- Did you follow the NINE (9) steps suggested? If not, did you motivate why you left out some of the steps? Refer p 335-336 ☐
- Are there no verbs indicated on the flows?  ☐
- Is there a verb in every process to indicate the ACTION performed?  ☐
- Did you make sure that there are no flows between external agents?  ☐
- Did you make sure that there are no flows between data stores?  ☐
- Did you make sure that there are no flows between an external agent and a data store?  ☐
- Did you make sure there is no magic (data is generated by a process out of thin air)?  ☐
- Did you make sure there is no black hole (data is lost in a process)?  ☐

Did you draw the physical DFD on the same NINE (9) steps suggested in chapter 9? ☐

- Did you adjust the shape for the external agents (name)?  ☐
- Did you adjust the shape for the processes (ID, process description, implementation)?  ☐
- Did you adjust the shape for the data stores (ID, implementation: table name)?  ☐
- Did you adjust the shape for the flows (implementation: flow)?  ☐
- Did you take your system's architecture into consideration? Refer p 483-502 <distributed? | db's?> ☐

Did you find and correct any mistakes on your logical DFD when you developed your physical DFD? ☐