THE OPEN UNIVERSITY OF SRI LANKA
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. DEGREE PROGRAMME 2017/2018
FINAL EXAMINATION
CSU4302/CPU2140: SYSTEM ANALYSIS AND SOFTWARE ENGINEERING
DURATION: **TWO HOURS ONLY (2 HOURS)**

Date: 21st April, 2019	Time: 9.30 a.m. to 11.30 a.m.

Question **Q1** is **compulsory**. Answer any **THREE** out of the remaining.

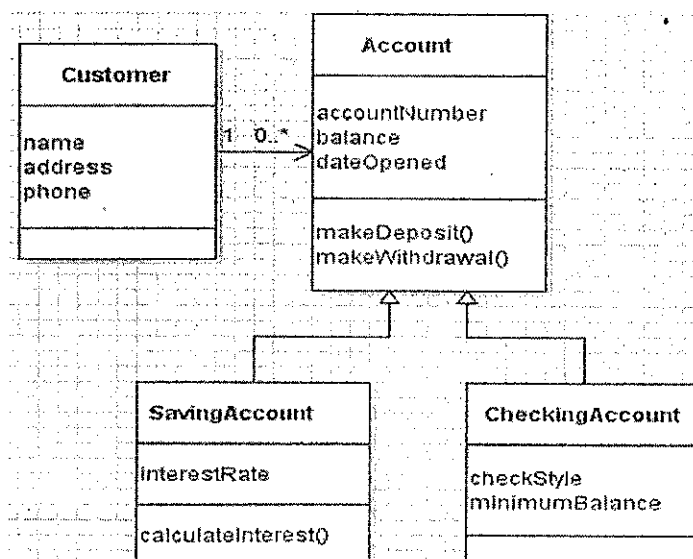**Answer questions based on the following explanation.**

ABC (PVT) LTD is a T-Shirts manufacturing, apparel factory for overseas market. An automated information system is used to handle the business functionalities (order processing, production, inventory management and shipping) in an effective and efficient way. The company is planning to expand its business in the online market. However, the architecture of the existing information system does not support to incorporate the new requirements. Hence, they are going to develop a new information system to satisfy the old requirements and new requirements within a six month period and with a limited budget. Further, they are planning to develop an e-commerce application along with the mobile application for their prospective online customers.

Q1).

a. Assume that you have been appointed to the software engineering team for the above project as an expert in UML. Explain how UML could be used for the above project.

b. Consider the class diagram given and make necessary changes to reflect the following:

> Expand the model to show that there are special types of customers: personal and commercial. All customers have name and mailing address. Commercial customers have additional properties for credit rating, contact person, and contact person phone number. Personal customers have properties for home phone number, work phone number. Additionally, the bank has multiple branches, and each account is serviced by one branch. Each branch has many accounts.

c. Assume that you are analyzing the requirements for the user login of e-commerce application of ABC (PVT) LTD described above. Imagine there are only two kinds of users that interact with the online system with different responsibilities: Regular users and Administrators. Both user groups can log in to the system, and part of the login is an internal authentication process. Further, they can register with the system, which also uses internal authentication. Draw a Use Case diagram that contains Actors, Use Cases and their relationships from the scenario described above.

Q2).

a. Assume the management is going to install a *generic product* for their e-commerce application. Analyze pros and cons of the decision.

b. Briefly explain the concept that repeats the activities over and over until the system reaches its ultimate need.

c. Suppose your project manager suggested to use RUP (Rational Unified Process) for the development of new software. Comment on this suggestion. (Note :- Clearly write down if you have any assumptions)

Q3).

a. Suppose you have collected requirements for the new development of the above system. An employee of the company said that he did not have an idea of the accuracy of the collected requirements of the functionality related to him. Describe the missing step/s of the requirement engineering process.

b. Describe the difference between the *user requirements* and *system requirements* by providing suitable examples from the description given above.

c. The company management said that the computer literacy of the employees at ABC (PVT) LTD is very poor. Propose five (05) non-functional requirements of the above system based on the statement given by the management.

Q4).

a. List the four types of software maintenance and identify the most appropriate maintenance type if new requirements are incorporated into the existing system, without developing a new software.

b. Assume ABC (PVT) LTD is planning to outsource the development of the new system and they have a fixed amount to spend on that. Identify the cost estimation technique that should be adopted by the software development company and discuss its pros and cons.

c. Briefly describe the benefits that will be available, if the software development team follows a quality management process.

Q5).

a. Briefly explain the purpose of using *design patterns* in the software development.

b. Explain your approach to demonstrate to the developer and the customer that the software meets its requirements.

c. Identify the steps that should be followed to implement the above system in the production environment (within the ABC (PVT) LTD).

Q6)

a. Assume you have been assigned as the project manager of the above project. Identify three (03) potential risks to the project and suggest strategies to mitigate each of them.

b. Do you think it is required to use a configuration control system for the above software project. Justify your answer.

c. Discuss the advantages of using CASE tools in configuration management.