Strathmore UNIVERSITY

SCHOOL OF COMPUTING AND ENGINEERING SCIENCES

BACHELOR OF SCIENCE IN ELECTRICAL AND ELECTRONICS ENGINEERING

CSE 2212 : OBJECT ORIENTED PROGRAMMING

END OF SEMESTER EXAM

Date: 5th December 2022 **Time:** 2 Hours

Instructions:

This Examination consists of **FIVE** questions

Answer **Question ONE (COMPULSORY)** and any other **TWO** questions.

Question 1 (30 marks)

a) Using Russel Abbott's approach identify the Objects, Classes, methods and Attributes from the IPesa Review Case . **(6 marks)**

b) Identify any Scenarios where inheritance and aggregation could be applied while building an Object-Oriented solution for a program like IPesa . **(4 marks)**

c) From the classes identified in (a) above, draw a UML class diagram illustrating the relationships and multiplicities. **(5 marks)**

d) Using Java, write one simple class, choosing from any of the classes you have drawn in (c) above. **(5 marks)**

e) Other than setter and getter write a complex method that you have listed in (a) above **(3 marks)**

f) Write a method named approveLoan() which accepts two parameters (totalIncome:double and existingLoan:Boolean). This method checks whether the amount being applied for is less than the applicant's total income and also if there is an existing loan for the applicant. If there is no existing loan and the amount being applied for is than the applicant's net income, then it returns true. **(4 marks)**

g) Write a main Method that would implement the method in (f) above. **(3 marks)**

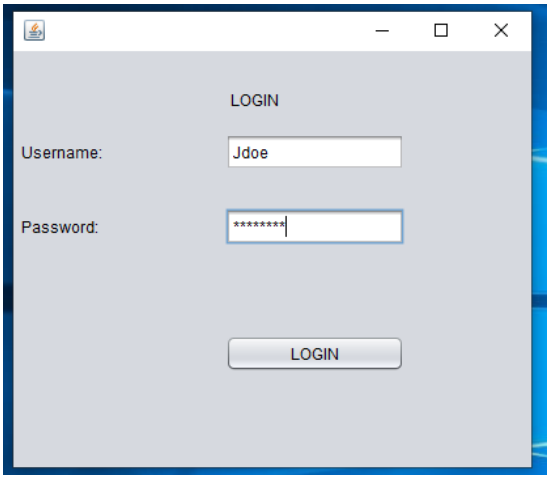
Question 2 (15 marks)

a) What is meant by the diamond inheritance problem in Object-Oriented programming **(5 marks)**

b) Write a java code snippet to illustrate how you solve the diamond inheritance problem **(10 marks)**

Question 3 (15 marks)

a) The GUI below is used for logging in a user into a simple Object-Oriented Program. Write a Java Code snippet for creating it. **(8 marks)**



b) Write a method using Java, that would implement Event Listeners in order to redirect the user to a home page (home.java) upon successful login. **(7 marks)**

Question 4 (15 marks)

a) Within an Object-Oriented Program there exists a method for computing the mean age for a Customer object. Using Java, write this method which takes in one parameter (age:int[]) which is an array of ages and returns the mean age. **(5 marks)**

b) When asked for their age in (a) above, a user enters a String value instead of an integer. Write a brief Java snippet that would be used to handle this exception. **(10 marks)**

Question 5 (15 marks)

a) With aid of Java code differentiate between the terms Instantiation and Initialization as used in Object Oriented Programming. **(7 marks)**

b) Write a Java code that differentiates any two types of polymorphism. **(8 marks)**

iPesa App Review

I recently came across the news that IPesa– the mobile lending app operating in Kenya, Tanzania and the Philippines, has secured Ksh.6.5 billion investment to expand its services to Mexico and India. From the description section, the IPesa app claims that a loan application will take 5 minutes, be approved in seconds and cash sent directly to MPesa. IPesa discloses right from the Play Store that it will scan my MPesa SMS and other information to determine my credit worthiness and that it won't be shared without my direct permission.

Additionally, the IPesa app asked to access my location, device/app history, contacts, call logs, caller information and the phone camera, I accepted and installed the app- it takes up more space (7.04 MB) on the phone than competitor Branch. The next step is setting up a 4-digit security pin which I quickly went through while giving the IPesa app permission to manage my phone calls (this is to secure my phone and the app claims that it won't make or receive calls from my device).

The registration process is short and I'm ready for a loan in less than five minutes. IPesa requires first-time loan applicants to verify their identity by filling in their information on a form in five steps provided on the app. I am prompted to fill my personal details (name, date of birth, email etc.) and the first step is done. The app proceeds to ask for permission to access contacts, messages and location to establish what my network is like-who I relate to etc. you can't get a loan without giving the permission. IPesa then asks for information regarding my education level, employment, what I'd like to use the loan for (you have to describe this in detail) and whether I have any outstanding loans.

I advance to the fourth step, where I must disclose my income; my main source of income, side hustle, how long I've been doing it, the amounts earned etc. As the last huddle, I can confirm all my previous answers before submitting as I await my fate. After review, my application is not approved for a loan (unfortunately), however, anyone who fails to get approval for a loan is legible to apply again after 30 days. Those whose applications get disapproved, may leave the IPesa app installed on their phone for some time as it increases their chances of getting a loan as the app keeps monitoring your phone and information based on your phone activity while building a credit rating for you.

In the whole application process, I get a sense that from the questions asked, the app tries to establish whether applicants have a consistent source of income for paying back the loan and whether the information they give is true. Hence have it in mind to frame your answers appropriately to establish credibility but do so accurately. Have applied for a loan on IPesa, how was your experience?

In a past interview with Social Tech, IPesa CEO John Schmidt said that the app looks at capacity, affordability and behavior as the criteria for lending. She added that IPesa determines whether to give you a loan by looking at details including transactions, savings data, account balances receipts for utility bills paid or unpaid. In other words, what this means is that if you ignore an unpaid-bills message from your water/power/insurance company lingering in your phone for too long, it could cost you a loan when you need it.