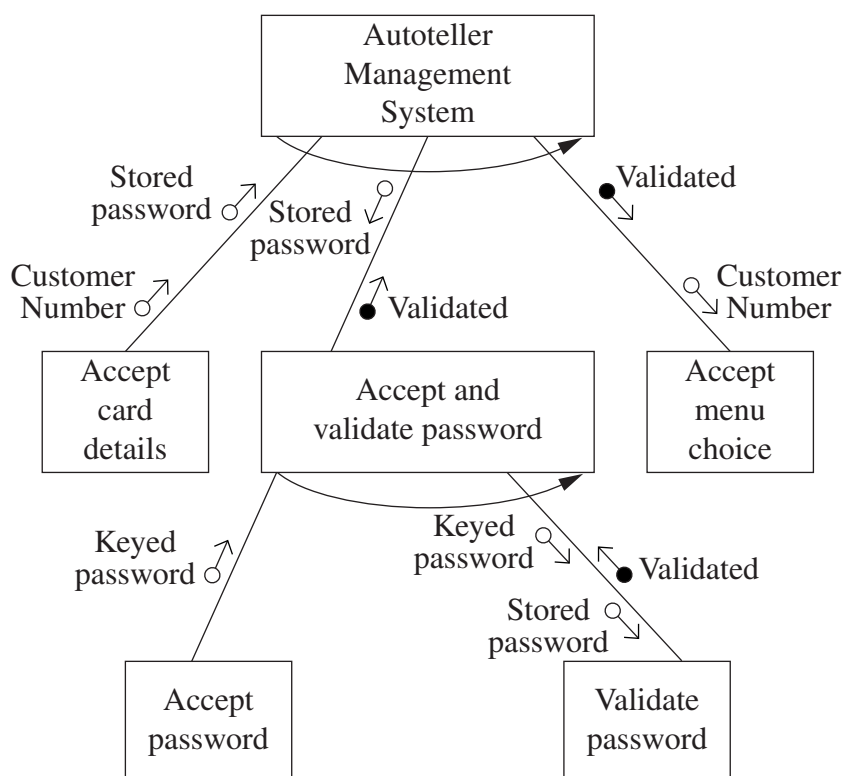


Question 22 (20 marks) Use a SEPARATE writing booklet.

(a) A large bank is building a secure internal network that will allow employees to interact directly with the company’s financial databases. The company decides to outsource the construction of software for the network.

- (i) Define the term *outsourcing*. 2
- (ii) Discuss the implications of outsourcing the construction of this software. 3
- (iii) Recommend steps to be taken during software development that ensure the reliability of the internal network systems operation. 4

(b)



A section of a Bank Autoteller Management System is described on the structure chart. There are other modules in the system, but they are not included as they are not relevant to the following questions.

- (i) Interpret the symbols $\circ \nearrow$ and $\bullet \nearrow$ used on a structure chart. 2

Question 22 continues on page 13

Question 22 (continued)

The following algorithm relates to parts (ii) and (iii) below.

```

1   BEGIN Autoteller Management System
2       System_on = TRUE
3       Validated = FALSE
4       WHILE Switched_on
5           Customer Number = 0
6           StoredPassword = " "
7           Validated = FALSE
8           CardInSlot = FALSE
9           WHILE NOT CardInSlot
10              READ cardslot
11              IF Card is located in cardslot THEN
12                  CardInSlot = TRUE
13              ENDIF
14          ENDWHILE
15          AcceptCardDetails (CustomerNumber, StoredPassword)
16          AcceptAndValidatePassword (StoredPassword, Validated)
17          IF Validated = TRUE THEN
18              AcceptMenuChoice(Validated, CustomerNumber)
19          ENDIF
20          READ System_on
21          Validated = TRUE
22      ENDWHILE
23  END

```

The above pseudocode represents the mainline of the Bank Autoteller Management System. The system has a logic error.

- (ii) Locate the error and describe its effect on the system. Using pseudocode similar to that of the original, alter the algorithm to remove the error. **4**
- (iii) Using pseudocode similar to the mainline, develop an algorithm to perform the task of the AcceptAndValidatePassword module. If the password is incorrect, the user is allowed two further attempts to enter a correct password. **5**

End of Question 22