PART C – LONG PROGRAMMING **[30 marks]**

Given the following class diagram in Figure X, sample of output in Figure X, and the description of class methods in Table X. Answer all questions in this part.

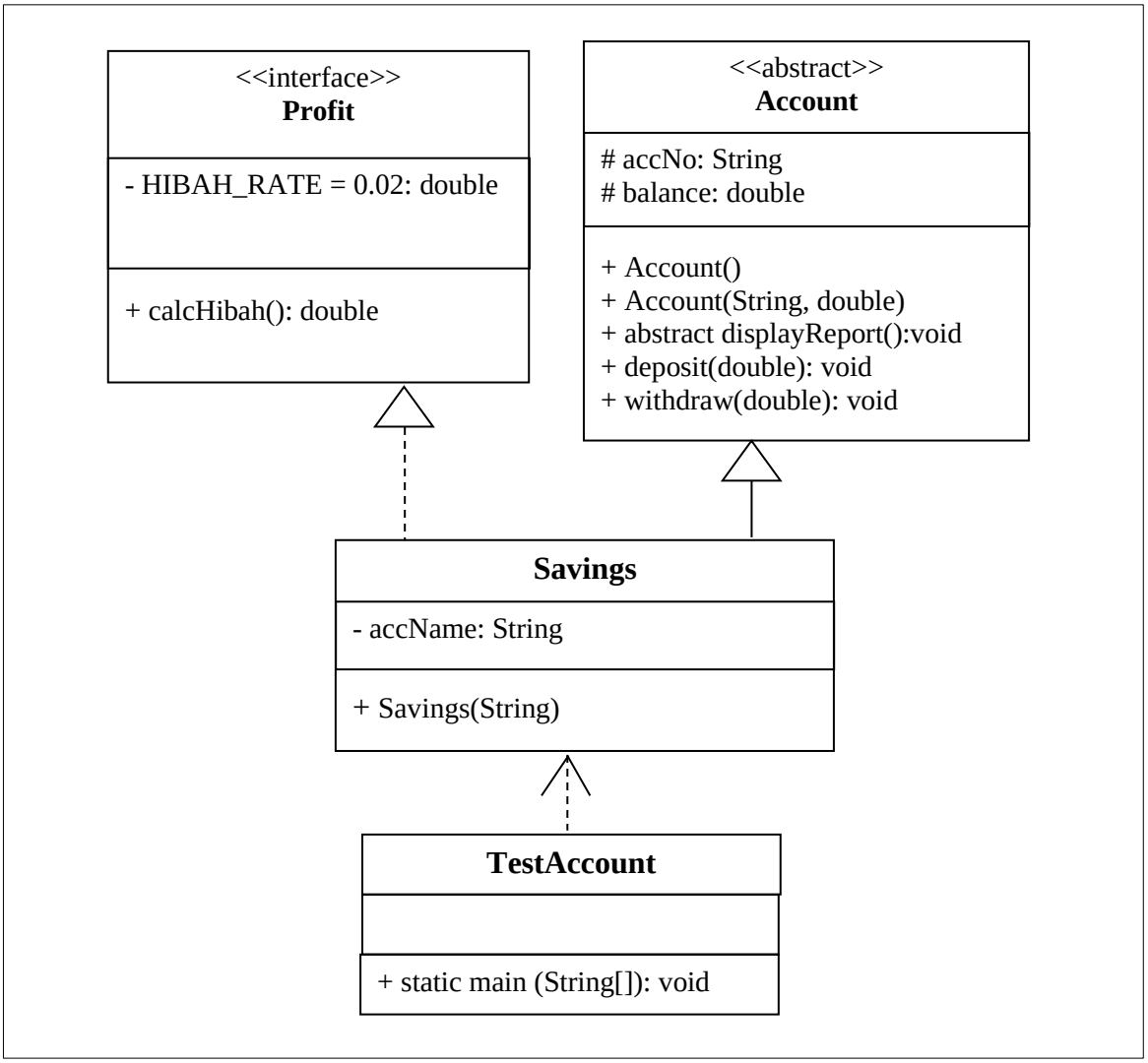

Figure X

Write a complete Java program that contains classes as shown in Figure X. The description of the classes as below:

i. The **`Account`** class which is an abstract class that contains two instance variables i.e. **`accNo`** represents customer account bank number and **`balance`** represents current balance in customer account; and five methods including two overloading constructors and one abstract method. [10 Marks]

ii. The **`Profit`** interface contains a constant variable i.e. **HIBAH_RATE** represents the hibah rate (Definition Hibah = Gift, donation); and an abstract **`calcHibah`** method**.**

[2 Marks]

iii. The **Savings** class which represents customer saving account that inherits **Account** class and implements **Profit** interface. The **Savings** class enables the customer to make deposit and withdraw transactions to their account. The **Savings** class contains one instance variable i.e. **accName** that represents customer name and one constructor. [6 Marks]

iv. The **TestAccount** class represents the application program that contains the **main()** method. The main method should do the following: [12 Marks]

a) Instantiates an object of class **Savings** with the account holder name **"Ahmad"**.

b) The **do**…**while** loop will display the following bank transaction menu:

```
******** BANK ACCOUNT MENU ********

1.  Savings Account Deposit
2.  Savings Account Withdrawal
3.  Display Report
4.  Exit

Please enter your choice (1-4) :
```

c) The switch-case choice or any selection tool to perform:

i. 1 – Ask the user to enter amount of deposit and call **deposit()** method.

ii. 2 – Ask the user to enter amount of withdraw and call **withdraw()** method.

iii. 3 – call **displayReport()** method.

Table X

Method	Description
Account()	A superclass default-constructor that initializes instances variables with "" and 0.00, respectively.
Account(String, double)	A superclass parameterized-constructor that receives account number of type String and account balance of type double, and initializes the instances variables with the received values.
Savings(String)	A subclass constructor which receives customer name. This constructor will call the superclass constructor to initialize the inherited instance variables with (**"001", 2000.00**) and then initialize its own instance variable with the received value.
calcHibah()	An overridden **Saving** class method which calculates monthly hibah earned (**balance * HIBAH_RATE**), update current account balance with hibah earned and then return the value of hibah earned of type double.
displayReport()	An overridden **Saving** class method which will call **calcHibah** method. Then display the earned hibah and ending balance of the account.
withdraw()	An **Account** class method that will check the condition of the current balance before processing the withdrawal transaction. If (request_amount < 0, then print the appropriate message) or if (balance – request_amount < 0, print the appropriate message) or if there is enough money in the account, then withdraw the requested amount and update the balance value (**balance - amount**).

deposit()	An **Account** method that always accept the deposit and update the balance value (**balance + amount**).

```
******** BANK ACCOUNT MENU ********

1.  Savings Account Deposit
2.  Savings Account Withdrawal
3.  Display Report
4.  Exit

Please enter your choice (1-4) : 1

Enter amount to deposit: 20.00
Please insert your cash.
Deposit accepted.
Your current balance is RM2020.00

******** BANK ACCOUNT MENU ********

1.  Savings Account Deposit
2.  Savings Account Withdrawal
3.  Display Report
4.  Exit

Please enter your choice (1-4) : 2
Enter amount to withdraw: 50.00
Please take your cash.
Your current balance is RM1970.00

******** BANK ACCOUNT MENU ********

1.  Savings Account Deposit
2.  Savings Account Withdrawal
3.  Display Report
4.  Exit

Your choice, please: (1-4) : 3

Monthly Hibah Earned: RM39.40
Ending Balance: RM2009.40

******** BANK ACCOUNT MENU ********

1.  Savings Account Deposit
2.  Savings Account Withdrawal
3.  Display Report
4.  Exit

Please enter your choice (1-4) : 4
Press a key to continue...
```

Note: The underlined words are the input entered by the user from the keyboard.

Figure X: Sample Output