

SECTION C – PROGRAMMING QUESTION**[Total marks 25]**

Section C consists of **ONE (1)** question only. You are required to answer this question in the answer space provided.

Every month, UTM-Mobile will summarize the profit of their telecommunication service. Once a month, the staff of UTM-Mobile will record the telecommunication charges for every customer. Write **C++ program** based on the following requirements:

- (i) The program consists of **main()** program and TWO (2) user-defined functions as listed in Table 4.
- (ii) In **main()** program, the user will input a list of customer's detail as depicted in Figure 14. The number of customer is depended on the user's input.
- (ii) Next, the **main()** program will call function **generateOverdue()** together with sending parameters as described in Table 4 to acquire the total overdue amount.
- (ii) Then, the **main()** program will call function **summaryProfit()** together with sending parameters as described in Table 4 in order to display the profit summary of their telecommunication service onto the output screen as described in Figure 15.
- (iv) For any floating value, it should be formatted into TWO (2) decimal places.

The input to the program might be as follows:

```
Enter number of customer: 10
Customer #1
Name: XXX
Account number: XXX
To-date charges (RM): XXX
To-date payment (RM): XXX
...
...
...
Customer #10
Name: XXX
Account number: XXX
To-date charges (RM): XXX
To-date payment (RM): XXX
```

Figure 14

The format of the output might be as follows:



Figure 15

The description of user-defined functions needed as follows:

Table 4. User-defined functions

Function	Description
<code>generateOverdue</code>	<p>This function receives the following parameters:</p> <ul style="list-style-type: none"> • Number of customer • A list of customer's name • A list of customer's account number • A list of customer's charges • A list of customer's payment <p>This function calculates the overdue amount for affected customers only. The formula is given as follows:</p> $\text{overdue} = \text{paid} - \text{charges}$ <p>Next, the function will sum up the overdue amount and returns that total to the <code>main()</code> program. Besides, the summary of overdue amount for every customer will be written into output file named as “overdue.txt”. The example of output file is described in Figure 16.</p>

Function	Description
summaryProfit	<p>This function receives the following parameters:</p> <ul style="list-style-type: none">• Number of customer• Total overdue• A list of customer's charges• A list of customer's payment <p>This function calculates the total of customer's charges and customer's charges payment. Next, the function will display the profit summary as depicted in Figure 15.</p>

The format of the output file is as follows:



Figure 16