

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:

```

UTM-Mobile MONTHLY PROFIT
Number of customer: 10
Total Charges (RM): XX.XX
Total Paid (RM): XX.XX
Total Overdue (RM): XX.XX

```

Figure 15

The description of user-defined functions needed as follows:

Table 4. User-defined functions

Function	Description
generateOverdue	<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 main() 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