SECTION A [32]

QUESTION 1 [10]

Indicate whether the following statements are TRUE or FALSE by making a cross in the applicable column.

	STATEMENT	TRUE	FALSE

1.1	The following while loop terminates when `j > 20`.
	
	`j = 0;`
	`while (j < 20)`
	`  j++;`		

1.2	Assignment expressions are useful when accumulating subtotals		
1.3	`**i` would be a valid counting statement		
1.4	`i--` will produce the same results as `--i`		
1.5	`k =--n` will produce the same result as `k = n--`		

1.6	Assume all variables are properly declared. The output of the following code is 2 3 4 5.
	
	`n = 1;`
	`while (n < 5)`
	`{`
	`  n++;`
	`  system.out.println(n +" ");`
	`}`		

1.7	The Method heading `int funcAlpha(float u, char v, int g)` in a Java program will cause a syntax error because the function return type is int and so the first parameter, u, must be of type int.		

1.8	Assume that all variables are properly declared. The following statement in a value-returning method is legal.
	
	`if (x % 2 == 0)`
	`  return x;`
	`else`		

	`return x + 1;`		
1.9	The return statement return `x + 1;` first returns the value of x and then increments the value of x.		

QUESTION 2 **[10]**

In each of the following cases, choose the letter of the most correct answer. Provide your answer by making a cross over the letter of your choice in the table on page 6:

2.1 In_____structures, the computer repeats particular statements a certain number of times depending on some condition(s).

a. looping
b. branching
c. selection
d. sequence
e. none of the above

2.2 What is the output of the following Java code?

```
count = 1;
num = 25;
while (count < 25)
{
    num = num - 1;
    count++;
}
System.out.println(count + " " + num);
```

a. 24 0
b. 24 1
c. 25 0
d. 25 1
e. none of the above

2.3 What is the next Fibonacci number in the following sequence?

1, 1, 2, 3, 5, 8, 13, 21, ...

a. 34
b. 43
c. 56
d. 273
e. none of the above

2.4 Which of the following is true about a do. while loop?
a. The body of the loop is executed at least once.
b. The logical expression controlling the loop is evaluated before the loop is entered.
c. The body of the loop may not execute at all.
d. It cannot contain a break statement.
e. all of the above

2.5 Given the following method header: int test(float, char); which of the following statements is valid?

a. System.out.println(test(12, &));
b. System.out.println << test("12.0", '&');
c. int u = test(5.0, '*');
d. System.out.println(test('12', '&'));
e. none of the above

2.6 A variable or expression listed in a call to a function is called the_____.

a. parameter
b. argument
c. data type
d. type of the function
e. none of the above

2.7 Given the method: double testAlpha(int u, char v, double t); which ofthe following statements is legal?

a. System.out.println(testAlpha(5, 'A', 2));
b. System.out.println(testAlpha(int 5, char 'A', int 2));
c. System.out.println(testAlpha('5.0', 'A', '2.0'));
d. System.out.println(testAlpha(5.0, "65", 2.0));
e. none of the above

QUESTION 3 **[12]**

3.1 Consider the following statements:

```
double num1, num2, num3;
int int1, int2, int3;
double value;
num1 = 5.0; num2 = 6.0; num3 = 3.0;
int1 = 4; int2 = 7; int3 = 8;

and method:

double cube(double a, double b, double c);
```

Which of the following statements are valid? State whether the following C++ statements are **valid** or **invalid**.

	Java Statement	**VALID/INVALID**
a.	`value = cube (num1, 15.0, num3);`	
b.	`System.out.print(cube(num1, num3, num2));`	
c.	`System.out.print(cube(6.0, 8.0, 10.5))`	
d.	`System.out.print(cube(num1, 7, num3));`	
e.	`value = cube(num1, int2, num3);`	
f.	`value = cube(7, 8, 9);`	

SECTION B [59]

INSTRUCTIONS FOR ANSWERING QUESTION 4 – 6:

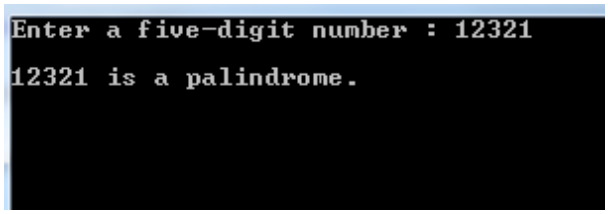
1. **Read through the question before you start coding.**
2. **Write meaningful comments for your coding.**
3. **Remember to SAVE REGULARLY! No marks will be assigned if an answer is lost due to incorrect saving methods and no extra time will be granted if work is not saved and there is a power failure or another kind of problem.**
4. **Create a folder on the D-drive (not the C-drive). Call this folder your student number. Save your work in this folder from the start. You must upload your work from this folder into EC. Use instructions on the last page to upload this question.**

QUESTION 4 [11

QUESTION 5 **[10]**

VALUE-RETURNING FUNCTIONS:

A palindrome is a number or a text phrase that reads the same backwards as forwards. For example, each of the following integers are palindromes 12321, 22222, 45554 and 11611. Given the main function, write a function that will receive a five-digit integer and determine whether or not it is a palindrome. Refer to the function prototype and calling statement to see function return type and parameters. See **Figure 5.1** and **Figure 5.2** below for sample output:



QUESTION 6 **[38]**

Write a complete Java program that will:

Have three (3) functions and one main function.

Function 1 (3 Marks):

This method named **getMenuOption(…)** should simply output on the screen the following menu, and then receive the menu option as an input and return the option to the calling function:

Select any option from the menu: 1. Add Airtime 2. Send SMS 3. Exit

Function 2 (4 Marks):

This method named **? AddAirTime(? pCurAirTime,? pArToAdd)** should receive two parameters.

The first parameter is **pCurAirTime,** this parameter will have as its value the user's current airtime balance.

The second parameter is **pArToAdd,** this parameter will have as its value the Rand value that should be added to the user's current airtime.

The method should return the new airtime balance after adding the amount to be loaded to the current balance.

Function 3 (5 Marks):

This method named **bool SendSMS(? pCurAirTime,? pSMSMes)** should receive two parameters.

The first parameter is **pCurAirTime,** this parameter will have as its value the user's current airtime balance.

The second parameter **pSMSMes,** this parameter will have as its value the sms text the user wants to send.

This method should return the Boolean value true if the user has enough airtime to send the SMS message. One SMS costs R2.

If the user does not have enough airtime to send the SMS message the function should show as output on the screen "Unable to send: **<<pSMSMes>>** and then return false.

main method (26 Marks):

When the program starts allow the user to input their current airtime balance.

The main function should then repeat the menu created in function 1 until the user inputs the number 3 to exit.

If the user inputs the number 1 ask the user to input the rand amount of airtime to be loaded. Using this information call function 2 and display the new airtime balance.

If the user inputs the number 2 ask the user to input the SMS message to be sent. Using this information call function 3. If the message was successfully sent output the users remaining airtime balance (Remember each SMS costs R2). If the SMS was not sent successfully output: "Oops first load airtime" in addition to the text already displayed by function number 3.

Note:

You may only use the do-while loop in this question (No other loop types allowed!)

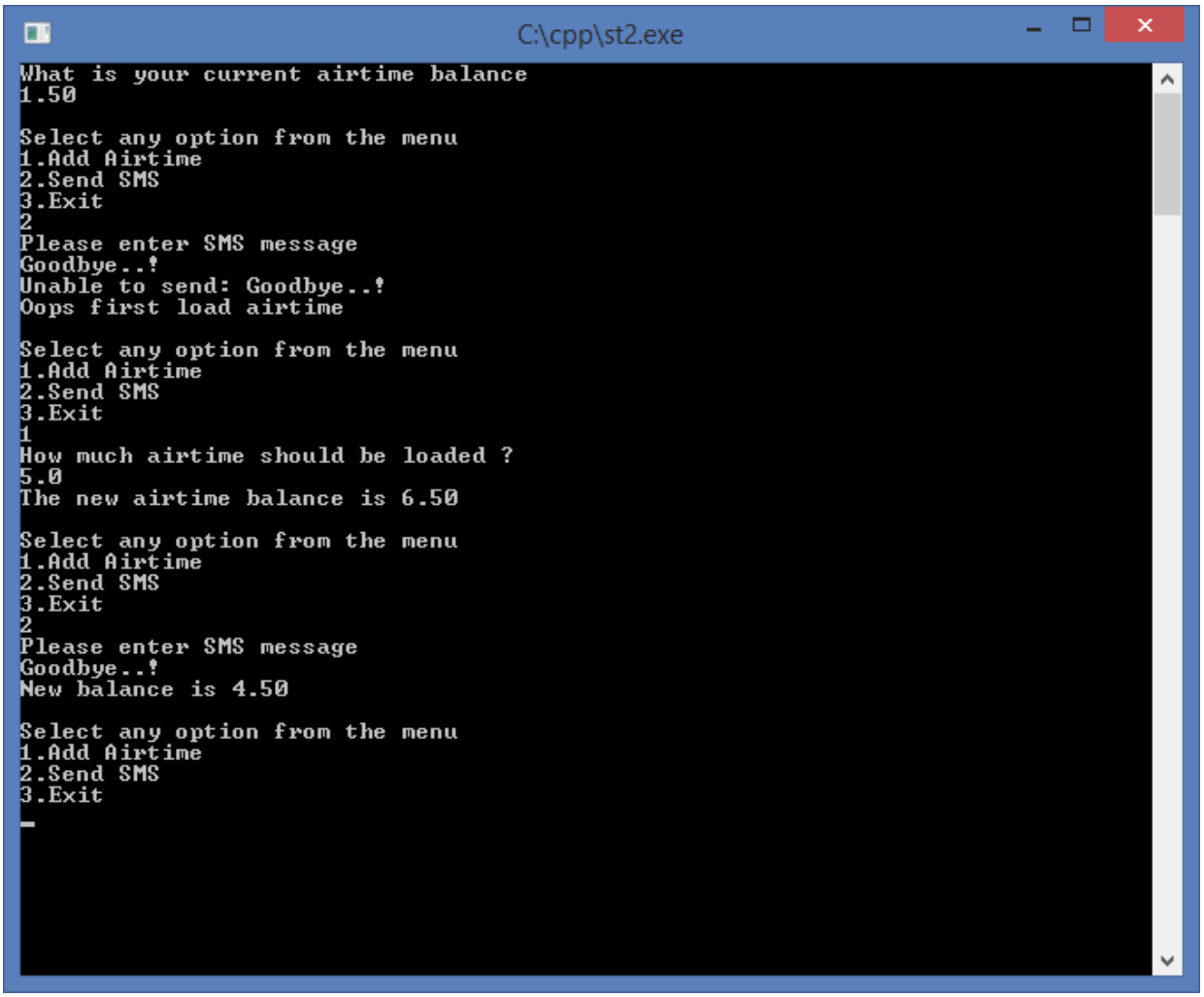


Figure 6.1