

ASSIGNMENT 2

**SUBJECT NAME : PROGRAMMING
TECHNIQUE 1**

SUBJECT CODE : SECJ 1013

SEMESTER : 1

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SECTION A – TRUE/FALSE QUESTIONS**[Total 8 marks]**

There are **FOUR (4)** questions in this section. For each statement given in this section, identify whether the statement is **TRUE/FALSE** and write your answer with your **reason** in the space given. Each question carries **2** marks.

1. The following C++ code in Figure 1 determines the amount of interest based on user's amount value in his/her account. If the amount value in his/her account falls under option 2, the program will only calculate interest = 2.6 for that particular's user account.

```
switch (account_value)
{
    case 1:
        interest = 2.3;
        break;
    case 2:
        interest = 2.6;
    case 3:
        interest = 2.9;
        break;
    default:
        interest = 0.0;
}
```

Figure 1

Answer : FALSE

Reason : Absence of break statement in switch case 2 causes the control passes to the statements for the next case (3) . The program will calculate interest = 2.9 when option 2 is selected.

2. If $x=3$ and $y=2$, the following segment program in Figure 2 will produce 0 when it is executed.

```

int main()
{
    int x, y;
    cout<<" Please enter two numbers: ";
    cin>> x>>y;

    for (int i=1;i<=y;i++)

        for (int j=1;j<=x;j +=2)
            {
                cout<<setw(2)<< y/x;
            }
    system ("PAUSE");
    return 0;
}

```

Figure 2

Answer : TRUE

Reason : It's produce 0 when it is executed while the input are 3 and 2 .

3. The `terminate()` function causes a program to terminate, regardless of which function or control mechanism is executing.

Answer : FALSE

Reason : The exit () function is use to terminate the execution of a program

Terminate() function cannot return to its caller, either by using return or by throwing an exception.

4. The output of the following program in Figure 3 is as illustrated in Figure 4.

```
#include <iostream>
using namespace std;

int call(int x){
    static int a = 10;
    int b;
    b=x;
    a+=b++;
    return a;
}

int main()
{
    cout << "The value return is " << call(5) << endl;
    cout << "The value return is " << call(12) << endl;
    system("pause");
    return 0;
}
```

Figure 3

```
The value return is 15
The value return is 27
Press any key to continue . . .
```

Figure 4

Answer : TRUE

Reason : The program displays the right output as shown in figure 4 without any errors.

SECTION B – STRUCTURE QUESTIONS**[Total marks 50]**

There are **FOUR (4)** structured questions. Answer all questions in the space provided. The marks for each part of the question is as indicated.

1. (a) Based on the information displayed in Figure 5, complete the missing C++ (Figure 6) code by writing a ternary conditional operator. [5 marks]

```
Enter 'y' or non-'y':  
y  
If 'y', answer is = 1  
Press any key to continue . . .
```

```
Enter 'y' or non-'y':  
p  
Else, answer is = 0  
Press any key to continue . . .
```

Figure 5

```
#include <iostream>  
using namespace std;  
  
int main()  
{  
    // initialize x to a dummy value  
    char x = 'n';  
    cout << "Enter 'y' or non-'y': " << endl;  
    cin >> x;  
    // write the output using the ?: operator  
  
    _____  
  
    _____  
  
    cout << endl;  
    system("pause");  
    return 0;  
}
```

Figure 6

Answer 1(a) :

```
#include <iostream>
```

```
using namespace std ;
```

```
int main()
```

```
{
```

```
    //initialize x to a dummy value
```

```
    char x = 'n' ;
```

```
    cout<< "Enter 'y' or non - 'y' : " <<endl;
```

```
    cin>> x ;
```

```
    //write the output using the ?: operator
```

```
    if ( x=='y' )
```

```
        cout<<"If 'y',answer is = 1"<<endl ;
```

```
    else
```

```
        cout<<"If 'y',answer is = 0"<<endl ;
```

```
    cout<<endl ;
```

```
    system("pause");
```

```
    return 0 ;
```

```
}
```



```
1: #include <iostream>
2: using namespace std;
3:
4: int main()
5: {
6:     char input;
7:     double balance=300;
8:     int amount;
9:
10:    cout<<"Welcome to Balok banking"<<endl;
11:    cout<<"Enter your transactions code, "<<endl;
12:    cout<<"d-deposit, "<<endl;
13:    cout<<"w-withdrawal, "<<endl;
14:    cin>>input;
15:
16:    switch (input)
17:    {
18:        case 'd': cout<<"Enter amount: ";
19:                cin>>amount;
20:                balance=balance+amount;
21:                cout<<"Your current balance is now RM"<<balance<<endl;
22:                break;
23:
24:        case 'w' : cout<<"Enter amount: ";
25:                cin>>amount;
26:                balance=balance-amount;
27:                cout<<"Your current balance is now RM"<<balance<<endl;
28:                break;
29:
30:        default : cout<<"The code is not allowed please try again";
31:                break;
32:
33:    }
34:
35:    return 0;
36:
37: }
```

2.

```
int main()
{
int a, x =0;
cout<<" please enter a number ";
cin>> a;

if (a == 1 || a==2)
    x ++;
else if ( a==3 || a==4)
    x--;
else cout << x+=2;
    cout << x;
system ("PAUSE");
return 0;
}
```

Figure 8

- (a) Based on C++ code in Figure 8, do the following amendment as follows:
- Convert the if statement to a switch-case statement.
 - Also, write an input validation loop that asks the user to enter a number in the range of 1 through 4. [7 marks]

Answer 2(a):

Answer 2(a):

```
int main()
{
    int a, x=0;
    cout<<" Enter a number ";
    cin>>a;
    while (a<1 || a>4)
    {
        cout<<"Number must be in the range of 1 till 4"<<endl;
        cin>>a;
    }
    switch(a)
    {
        case 1 : case 2 : x++;
                cout<<x;
                break;
        case 3 : case 4 : x--;
                cout<<x;
                break;
        default: cout<< (x+=2);
                cout<< x;
                break;
    }
    return 0 ;
}
```

3. You are required to develop a program to compute and display the charges for patients of Hospital Tun Aminah Johor.

(a) Write a function to get the inputs from user. The function should accept reference arguments in order to access the parameters in the `main()` function. The function should ask for the following attributes in Table 1: [4 marks]

Table 1

Patient Attributes
Number of days spent
Daily room rate
Medication charges
Service charges

Answer 3(a):

```
void getInputs( int &d, double &r, double &m, double &s)
```

```
{
```

```
    cout<<"Number of days spent in hospital : " ;
```

```
    cin>>d;
```

```
    cout<<"Daily room rate : RM " ;
```

```
    cin>>r;
```

```
    cout<<"Medication charge : RM " ;
```

```
    cin>>m;
```

```
    cout<<"Service charge : RM " ;
```

```
    cin>>s;
```

```
}
```

(b) There are two types of patient in Hospital Tun Aminah Johor as described in Table 2. In the program, patient's type is declared as global variable. The following formula in Table 2 is used to compute the total charges. Write two overloaded function to calculate the total charges. One of the functions should accept arguments for the in-patient, while the other function accepts arguments for out-patient. Both functions should return the total charges. [5 marks]

Table 2

Type	Formula
In-patient	Total charges = Number of days spent * Daily room rate + Medication charges + Service charges
Out-patient	Total charges = Medication charges + Service charges

Answer 3(b):

```
double totalCharges(int d, double r, double m, double s)
```

```
{
```

```
    double charges=d*r+m+s;
```

```
    cout<<"Total charges is RM " <<charges<<endl;
```

```
}
```

```
double totalCharges( double m, double s )
```

```
{
```

```
    double charges=m+s;
```

```
    cout<<"Total charges is RM " <<charges<<endl;
```

```
    return charges;
```

```
}
```

4. (a) Based on the Program in Figure 9, what is the output displayed when the program is executed? [2 marks]

```
#include <iostream>
using namespace std;

int two(int n)
{
    int ans;
    if (n==1)
        ans=0;
    else
        ans = 1+two(n/2);
    return ans;
}

int main()
{
    int y;

    y = two(13);
    cout<< y;
    system("pause");
    return 0;
}
```

Figure 9

Answer 4(a):

3Press any key to continue.....

.....

(b) What is the output of the below program (Figure 10) if the user enters **12** and **14**?

[9 marks]

```
#include <iostream>
using namespace std;

void func1(int = 5, int = 6);
void func2(int &, int &, int &);
void func3(int&, int&);
void func4(int,int,int);

int main()
{
    int x=0, y=0,z=0;
    func1();
    cout<<x <<" "<<y<<" "<<z<<endl;
    func3(x,y);
    cout<<x <<" "<<y<<" "<<z<<endl;
    func2(x,y,z);
    cout<<x <<" "<<y<<" "<<z<<endl;
    func4(x,y,z);
    cout<<x <<" "<<y<<" "<<z<<endl;
    system("pause");
    return 0;
}

void func1(int a, int b)
{
    a++;
    b+=a;
    cout<<a<<" "<<b<<endl;
}

void func2(int &a, int&b, int&c)
{
    b++;
    c--;
    a=b+c;
}

void func3(int &a, int&b)
{
    cout<<"Enter two numbers: ";
    cin >> a >> b;
}

void func4(int a, int b, int c)
{
    a=b-c;
    cout <<a << " " << b <<" " << c << endl;
}
}
```

Figure 10

Answer 4(b):

```

6 12
0 0 0
Enter two numbers : 12 14
12 14 0
14 15 -1
16 15 -1
14 15 -1
Press any key to continue.....

```

(c) Given the following excerpted program (Figure 11):

```

#include <iostream>
#include <iomanip>
using namespace std;

int input();
int totalDay(int);
double calcAvg(int, int);

int main()
{
    int x;
    double avg;
    x = input();
    avg = calcAvg(x, totalDay(x));
    cout<<fixed<<showpoint<<setprecision(2);
    cout<<avg;
    system("pause");
    return 0;
}

```

Figure 11