Assignment 3 Programming technique 1

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Section : 02

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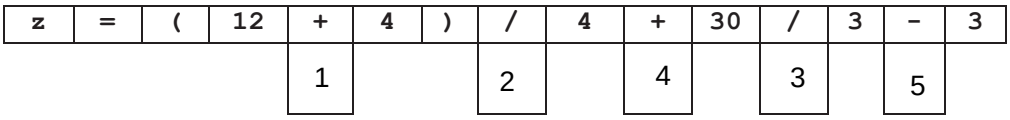
1. There are five operators shown in the expression as in the given figure. Label the order of execution for each operator in the boxes as stated in the expression. The operator that will be executed first should be labeled as 1, the second operator to be executed should be labeled as 2, and so on. Finally give the result of the expression according to this sequence of executions.

[3 marks]



Answer: 11

2. Refer to **Program 1** below which is incomplete. As a result of the prompt on line **9**, assume that the input string entered is "ABCDEFG HIJKL". Write the corresponding output to be displayed for each of the corresponding codes in Code 1, Code 2 and Code 3 as given in the boxes after **Program 1**.

[7 marks]

```
 1  // Program 1
 2  #include <iostream>
 3  #include <iomanip>
 4  using namespace std;
 5
 6  int main( )
 7  {
 8     char   x[13];
 9     cout << " Enter a string : ";
10
11     // either Code 1, 2 or 3
12     // will be placed here
13
14  return 0;
15  }
```

Code 1: [2 marks]

```
cin>>x;
cout<<x<<endl;
```

Output:

A	B	C	D	E	F	G						

Code 2: [2 marks]

```
cin.getline(x,13);
cout<<x<<endl;
```

Output:

A	B	C	D	E	F	G		H	I	J	K	

Code 3: [3 marks]

```
cin>>x;
cout<<setw(13)<<x<<endl;
```

Output:

						A	B	C	D	E	F	G

3. The following C++ program, **Program 2** cannot be compiled. Rearrange the lines in the correct sequence in order for the program to be compiled and executed to produce the output as indicated.

[5 marks]

```
1  // Program 2
2  cout << "Success\n";
3  cout << " Success\n\n";
4  int main()
5  cout << "Success"; }
6  using namespace std;
7  #include <iostream>
8  cout << "Success\n";
9  {
10 return 0;
```

Program output :

```
Success
Success

Success Success
```

Use the table below to rearrange the lines based on the output given.

1	//Program 2
2	#include <iostream>
3	using namespace std;
4	int main()
5	{
6	cout<<"Success\n";
7	cout<<"Success\n\n";
8	cout<<"Success";
9	cout<<"Success\n";
10	return 0;
11	}

4. Write C++ **`if`** statement code fragments to satisfy the given conditions.

[10 marks]

i.	Check the range of frequency, **`freq`** to be between 100Hz and 10000Hz. Display **`"Acceptable"`** if within the range and **`"Unacceptable"`** if not. (3 marks)

ii.	Check the prerequisite for a soldier candidate to be of **`age`** between 18 to 30 years, **`weight`** between 50 to 65kg and **`height`** must be greater than 156m. Display **`"Fulfill requirements"`** or **`"Do not fulfill requirements"`** based on these conditions. (3 marks)

iii.	Henry wants to buy a car. It must be under one of these conditions. Either: (a) The **`year`** made: after 2010, cylinder capability: **`cc`** between 1.5 to 2.0. ***or*** (b) The **`year`** made: before 2010 , cylinder capability: **`cc`** greater than 2.0. His decision either to **`"Purchase car"`** or **`"Do not purchase car"`** should be reflected in the code. (4 marks)

Question 4

i.

```
if(freq>=100 && freq<=10000)
{
	cout<<"Acceptable"<<endl;
}
else
{
	cout<<"Unacceptable"<<endl;
}
```

ii.

```
if(age>=18 && age<=30)
{
	if(weight>=50 && weight<=65)
	{
	if(height>156)
	{
		cout<<"Fulfill requirements"<<endl;
	}
	else
	{
	cout<<"Do not fulfill requirements"<<endl;
	}
	}
	else
	{
	cout<<"Do not fulfill requirements"<<endl;
	}
```

```
}
else
{
        cout<<"Do not fulfill requirements"<<endl;
}
```

iii.

```
if(year>2010)
{
        if(cc>=1.5 && cc<=2.0){
                cout<<"Purchase car"<<endl;
        }
        else{
                cout<<"Do not purchase car"<<endl;
        }
}
else
{
        if(cc>2.0){
    cout<<"Purchase the car"<<endl;
        }
        else{
                cout<<"Do not purchase car"<<endl;
        }
}
```

5. Fill in the spaces provided in order for the program segment to produce the output as shown.

```
// Question 5.a. – [8 marks]
int x = __15_____;                    //(a)
do {
   x--;
   if (x % ____2____ == ____1____)    // (b) and (c)
      continue;
   cout << x << "  ";
} while (x >= ____4____);             // (d)
```

Output:

```
14  12  10  8  6  4
```

6. Based on the flowchart given in **Figure 1**, answer parts (i) to (iii) of this question.

[10 marks]

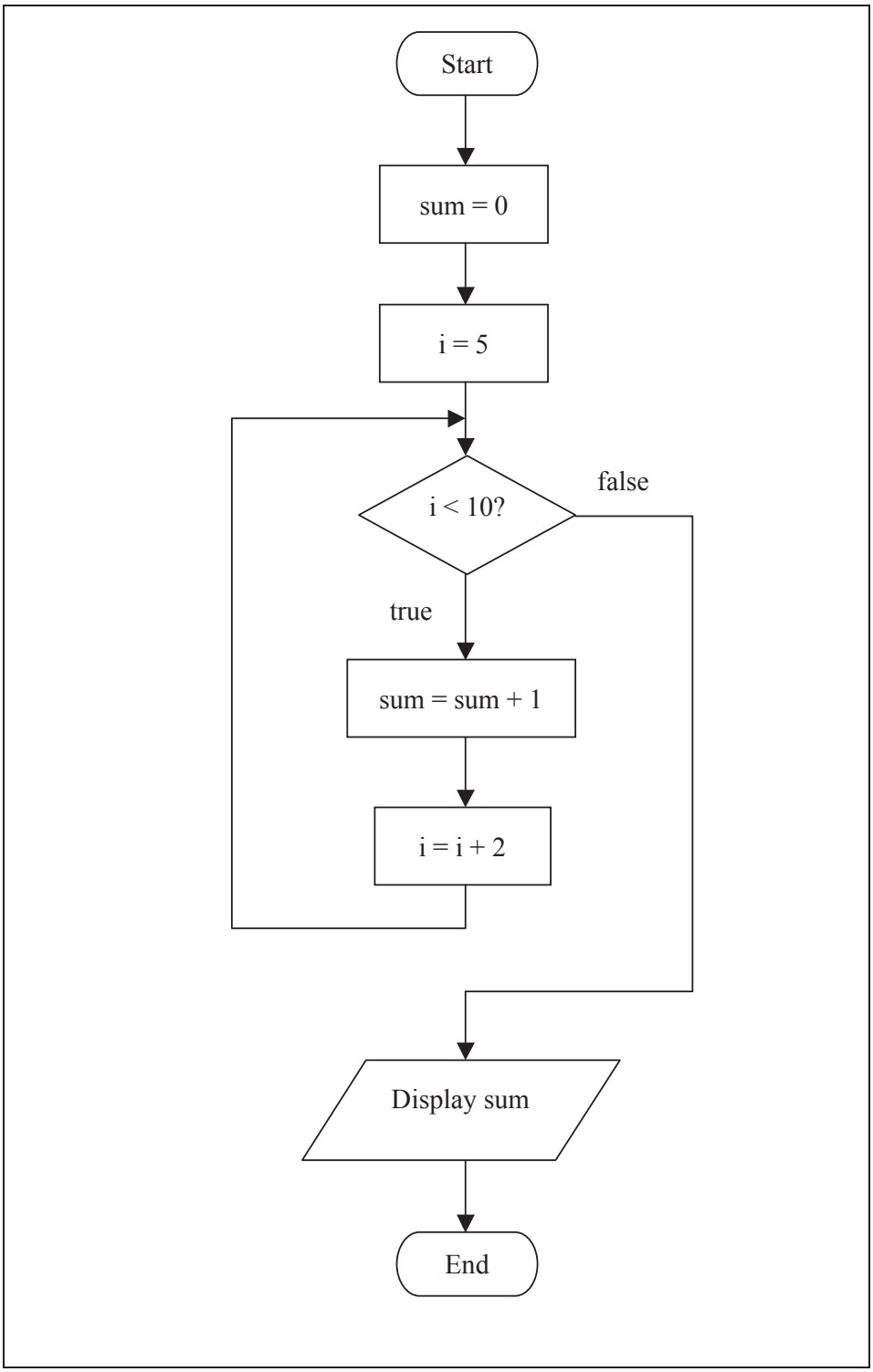


Figure 1

i. Convert the given flowchart into its equivalent C++ code excerpt. (4 marks)

ii. How many times the loop repeat. (2 mark)

iii. Modify your code by using decrement counter loop without changing the variables involved and the number of loops involved. (4 marks)

7. **Program 3** is able to count the number of input character of **A**, **B** and **C**. The program will loop reading the input until the sentinel value **e** is being input. The sample output of the program is as shown:

[20 marks]

```
Enter the letter grades[Enter 'e' character  to end input]
A
Enter the letter grades[Enter 'e' character
B
Enter the letter grades[Enter 'e' character
C
Enter the letter grades[Enter 'e' character
C
Enter the letter grades[Enter 'e' character
C
Enter the letter grades[Enter 'e' character
e

Totals for each letter grade are:
A: 1
B: 1
C: 3
Press any key to continue . . .
```

Complete **Program 3** based on the comments given

```
1   //Program 3
2   #include <iostream>
3   using namespace std;
4
5   int main()
6   {
7        char grade;      // one grade
8        int aCount = 0; // number of characterAs
9        int bCount = 0; // number of Bs
10       int cCount = 0; // number of Cs
11
12  cout << "Enter the letter grades[Enter 'e' character  to end
13  input]"<< endl;
14  cin>>grade;
15
16  // loop: as long as sentinel value has not been achieved
17  while (grade != 'e')_____ {      // (a)          - 2 marks
18
19
```

```
20 //write appropriate statement for testing input cases
21    switch(grade)                          // (b)          - 2 marks
22
23 //in case of input A, increment variable aCount          - 3 marks
24
25  case 'A'   :                             // (c)
26              aCount++;                    // (d)
27              break;                       // (e)
28
29 //in case of input B, increment variable bCount          - 3 marks
30
31  case 'B'   :                             // (f)
32              bCount++;                    // (g)
33              break;                       // (h)
34
35 //in case of input C, increment variable cCount          - 3 marks
36
37  case 'C'   :                             // (i)
38              cCount++;                    // (j)
39              break;                       // (k)
40
41 //add the statement to catch all other alphabets and prints
42 //"Incorrect letter grade entered."                      - 3 marks
43
44    default  :                                    // (l)
45          cout<<"Incorrect letter grade enter."<<endl;    // (m)
46          break;                                  // (n)
47
48 } // end test cases
49
50 //ask for another input letter grades                    - 2 marks
51 cout << "Enter the letter grades[Enter 'e' character to end input]"<< endl;  // (o)
52 cin>>grade;                                              // (p)
53
54 } // end loop
55
56 // output summary of results                            - 2 marks
57     cout<<"Total for each letter grade are:"<<endl;
58     cout<<"A: "<<aCount<<endl;     // (q) display number of A grades
59    cout<<"B: "<<bCount<<endl;      // (r) display number of B grades
60    cout<<"C: "<<cCount<<endl;      // (s) display number of C grades
61
62        return 0;
63  } // end function main
```