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]

z	=	(	12	+	4	)	/	4	+	30	/	3	–	3
				1			2		4		3		5	

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]	Output:
```cin>>x;cout<<x<<endl;```	A B C D E F G (+ 6 empty boxes)

Code 2: [2 marks]	Output:
```cin.getline(x,13);cout<<x<<endl;```	A B C D E F G (space)(space) H I J K (empty box)

Code 3: [3 marks]	Output:
```cin>>x;cout<<setw(13)<<x<<endl;```	(6 empty boxes) 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)

	``cpp
	if (freq>99 && freq<10001){
	    cout<<"Acceptable"<<endl;
	  }
	
	  else{
	    cout<<"Unacceptable"<<endl;
	  }
	``

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)

	``cpp
	if ((age>17 && age<31) && (weight>49 &&
	weight<66) && (height>156)){
	    cout<<"Fulfill requirements"<<endl;
	  }
	
	  else{
	    cout<<"Do not fulfill
	requirements"<<endl;
	  }
	``

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)

	``cpp
	if ((year>2010 && cc>=1.5 && cc<=2.0) ||
	(year<2010 && cc>2.0)){
	    cout<<"Purchase 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
```

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 entered.";   // (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
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
```