Iqra National University Peshawar Pakistan

Department of Computer Science

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Paper :	**Programming Fundamentals**	Date and Starting Time:	**26/June/2020, 9:00 am**
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Note: Attempt all Questions. Help can be taken from net where ever is required.

Q.1

a) What is the purpose of ***if statement***? Discuss its two different forms with examples.

ANSWER:

PURPOSE;

The purpose of IF statement is that it is used to create a decision structure, Which allows a program to have more than one path of execution. Causes one or more statements to execute only when a Boolean expression is true. Control structure a logical design that controls the order in which a set of statements execute.

TWO DIFFERENT FORMS:

There are a few different structures that must be used depending on what form of the structure you are using they are as follows,

The simple logical if,

In a simple logical if, all that is need is some Logical expression enclosed in parenthesis and some executable statement following the Logical expression. The statement will only be executed if the Logical expression evaluates is true.

If then - else structure,

This is the first statement in an if-then-else structure. It contains the first logical expression to be evaluated. If the logical expression evaluates to true. Then only those statements beginning with the following one and ending before the next ELSE or ENDIF will be evaluated. All other statements in the structure will be ignored and not

EXAMPLE:

if (delta.ge.1.) then

```
print *, ' Too much deflection'
else if ( shear.ge.21.) then
print *, 'Beam fails in shear'
else if ( sigma.ge.36.) then
print *, 'Beam fails in tension'
else if ( sigma.le.-36.) then
print *, 'Beam fails in compression'
else
print *, 'Beam will not fail under these'

& ' conditions'
end if
```

b Write a C++ program toread two numbers from keyboard and then find the LARGEST number of them.

ANSWER:

```
#include<iostream>
#include<stdio.h>
#include<string.h>
#include<stdlib.h>

using namespace std;

int main()
{
        int num1,num2;
        cout<<”Please enter Number 1:  “;
        cin>>num1;
        cout<<endl;

        cout<<"Please enter Number 2:  ";
        cin>>num2;
        cout<<endl;

        if(num1>num2)
        {
        cout<<"The largest number is: " +num1<<endl;
        }

        Else
        cout<<"The largest number is: " +num2<<endl;

        return 0;
}
```

Q.2 a) What are the Logical Operators? Explain them

ANSWER:

Explanation;

A logical operator is a symbol or word used to connect two or more expressions such that the value of the compound expression produced depends only on that of the original expressions and on the meaning of the operator. Common logical operators include AND, OR, and NOT.

Within most languages, expressions that yield Boolean data type values are divided into two groups. One group uses the relational operators within their expressions and the other group uses logical operators within their expressions.
The logical operators are often used to help create a test expression that controls program flow. This type of expression is also known as a Boolean expression because they create a Boolean answer or value when evaluated. There are three common logical operators that give a Boolean value by manipulating other Boolean operands. Operator symbols and/or names vary with different programming languages

b) Write a C++ program to get Temperature in Fahrenheit ***F*** and then find the Atmosphere according to the below rules: **5**

- If temperature ***F*** is above 40 degree Fahrenheit then display…………………..Very Hot.
- If temperature ***F***is between 35 & 40 degree Fahrenheit then display………Tolerable.
- If temperature ***F*** is between 30 & 35 degree Fahrenheit then display………Warm.
- If temperature ***F*** is less than 30degree Fahrenheit then display………….……Cool.

ANSWER:

```
#include<iostream>
#include<stdio.h>
#include<string.h>
#include<stdlib.h>

using namespace std;

int main()
{
        int temp;
        cout<<”Please enter temperature in Fahrenheit :  “;
        cin>>temp;
        cout<<endl;

if (temp>40)
{
cout<<”Very Hot”
}
if (temp<30)
{
cout<<”Cool”
}
if (temp>34 && temp<41)
{
cout<<”Tolerable”
}
if (temp>29&&temp<36)
{
cout<<”Warm”
}
        Return 0;
}
```

Q.3 a) What does ***Looping*** mean? Explain different loops in C++.

5

ANSWER:

In computer programming looping is a programming structure that repeats a sequence of instruction until a specific condition is met. Programs use loops to cycle through values, adds sums of numbers, repeat functions and many other things.

There are three types of loops in C++ that is given below,

1. ***for*** loop,
2. ***while*** loop,
3. ***do…while*** loop.

Explanation of *for* loop:

A for loop is used for executing a block of statements repeatedly until a particular condition is satisfied. if you are displaying number from 1 to 100 you may want set the value of a variable to 1 and display it 100 times, increasing its value by 1 on each loop iteration.

SYNTAX:

```
for (initialiazation ; condition  ;  increment/decrement)

{

C++ statement(s);

}
```

Explanation of *while* loop:

In C++ while loops statement allows to repeatedly run the same block of code until a condition is met. While loop has one control condition, and executes as long the condition is true. The condition of the loop is tested before the body of the loop is executed , hence it is also called an entry-controlled loop.

SYNTAX:

```
While  (condition)

{

Statement(s);

Incrementation ;

}
```

Explanation of *do…while* loop:

The do…while loop is a variant of the while loop. This loop will execute the code block once, before checking if the condition is true, then it will repeat the loop as long as the condition is true.

SYNTAX:

```
Do
 {
   statement(s);

while( condition );
}
```

b) Write a C++ program toread a number from keyboard and then determine whether it is ***Even or Odd*** number?

ANSWER:

```
#include<iostream>
#include<stdio.h>
#include<string.h>
#include<stdlib.h>

using namespace std;

int main()
{
int num;
cout<< "Enter an Number : ";                                        5
cin>> n;

    if ( num % 2 == 0)
{
cout<< num<< " is even.";
}
    else
{
cout<< num<< " is odd.";
}
    return 0;
}
```

Q.4 a) What is the purpose of using ***break and continue statements***?

ANSWER:

PURPOSE OF CONTINUE STATEMENT;

The continue statement is used to prematurely end the current iteration and move on to the next iteration. When the continue statement is encountered in a loop, all the statements after the continue statement are omitted and the loop continues with the next iteration.
The continue statement is used in conjunction with a condition.

PURPOSE OF BREAK STATEMENT;

When break statement is encountered within the loop, the program control immediately breaks out of the loop and resumes execution with the statement following the loop. The break statement is commonly used in conjunction with a condition.

b) Write a C++ program to find the sum of the following numbers:

1+2+3+………+10

ANSWER:

```
#include<iostream>
#include<stdio.h>
#include<string.h>
#include<stdlib.h>
```

5

```
using namespace std;

int main()
{

int n1 =1;
int n2 =2;
int n3 =3;
int n4 =4;
int n5 =5;
int n6 =6;
int n7 =7;
int n8 =8;
int n9 =9;
int n10 =10;
 //sir I took variables instead of direct number addition just because in
future we can take input from user and store in variable. TIA

int sum = n1+n2+n3+n4+n5+n6+n7+n8+n9+n10;
cout<<"The sum of 1+2+3+………+10 is: "+sum;
cout<<endl;

return 0;
}
```

Q.5 What is an array? Explain On-Dimensional and Two-Dimensional Arrays with examples.

ANSWER:

Array:

In computer programming languages an array is used to store multiple values in one variable. It is quite useful traditionally we have to declare a lot of variable of store multiple value but array addressed our this issue.

There are generally two different types of Array.

1. Single Dimensional Array
2. Multi Dimensional Array

Both are explained below:

One Dimensional Array:

One-Dimensional Array is an array which have single row of data stored in it.

20	30	40	50	60
A[0]	A[1]	A[2]	A[3]	A[4]

We can declare the above showed array in C++ as:

```
Int  A[5]; //A[5] is the array which have length of 5. Means we can store 5 values in this array

// Storing Values init

A[0]=20;
A[1]=30;
A[2]=40;
A[3]=50;
A[4]=60;

//Displaying Array Values:
Cout<<A [0];  // This will display the values store in A[0] index.
```

<u>Two Dimensional Array:</u>

Two-Dimensional Array is an array which have two rows of data stored in it. It is also known as 2D – Array

20 - A[0][0]	30 - A[0][1]	40 - A[0][2]
50 - A[1][0]	60 - A[1][1]	60 - A[2][2]

Here is my array A[2][3] which is conceptually viewed as the figure drawn above.

We can declare the above showed 2D-array in C++ as:

```
int A[2][3];

//// Storing Values init

A[0][0]=20;
A[1][0]=50;
.
.
.
.
A[2][2]=60;
//Displaying Array Values:
Cout <<A[1][2];  // This will display the values store in A[1][2] index which
```

is 50.

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