Sample Paper - II
Subject – Computer Science

Max Marks 70   Duration 3 hrs

Note:- All questions are compulsory

Q1)
  a) What is significance of My Computer   ?   2

 b) Explain different types of operating systems .   1

c) What is an Operating System? Explain its any two functions   2

d) How is a compiler different from interpreter?   2
e)   Convert
   (i) $(10.10)_{10} = (\ ?\ )_2$

  (ii) $(101011.1110)_2 = (\ ?\ )_{10}$ 2

Q2)
a) What do you mean by run time error?   1

b) what is the deference between if and if – else statement   2

c) Mention and explain briefly any three   characteristics of a good program   2

d) How can you give a single line and multiline comments in C++ explain with
   suitable examples   2

e) what do you mean by header files? What is the difference between #include <iostream.h> and
#include"iostream.h"   2

Q3)
a) Classify   the following variable names of c++ into valid and invalid category   2
   (i) 1no (ii) num   1 (iii) num (iv) num1num (v) num+1 (vi) num.1

b) Give output of following code.   3
```
   #include<iostream.h>
int m=5; void check();
void main( )
{ int m=20;
      {
      int m=10*::m;
      cout<<"m="<<m<<"::m="<<::m<<endl;
      } check();
      cout<<"m="<<m<<"::m="<<::m<<endl;
      check(); cout<<"::m="<<::m<<"m="<<m<<endl;
      }
       void check()
      { ++m;

   }
```

c) What will be result of following statements if a=5 , b=5 initially   2
   (i) ++a<=5 (ii)   b++<=5

d)Name the header file(s) that shall be needed for successful compilation of the
following C++ code.   2

```
            void main( )
            {
              char name[40];
              strcpy(name,"India");
              puts(name); }
```

e) Explain conditional operator (?) with example in c++ .   2

f) What is difference between '/' and '%' operators in c++ ? explain with a example
                                                                                          2

Q4)

a) What do you mean by function prototype in C++   2

b) Explain Break and Continue statement in C++ with example.   2

c) Find syntax error(s) if any in following program (Assume all header files are present) 2

```
 main<>
{ int c;
 switch( c );
case 1.5:  { cout<<" India is great\n";
          } break;
'case' 2:  { cout<<" hello\n";
          } break;
} // end of main
} // end of switch
```

d) How will you declare and define   1
   i)Array named mark with 10 integer values
   ii)array named avg with 8 float values

e) Convert following while loop to for loop   2
```
int   x=0;
while(x<=100)
{  cout<<" the value of x is \n"<<x;
   cout<<"done \n";
  x+=2;
}
```

f) Define token ?   1

g) What is the difference between call by value and call by reference explain with
   suitable example   2

h)Find the output of the following program;   **3**

```
#include<iostream.h>
#include<ctype.h>
void main( )
{ char Text[ ] = "Comp@uter!";
for(int I=0; Text[I]!='\0';I++)
{ if(!isalpha(Text[I]))
Text[I]='*';
else if(isupper(Text[I]))
Text[I]=Text[I]+1;
else
Text[I] = Text[I+1]; }
cout<<Text; }
```

i) What are differences between for and do- while loop ?   explain with example   2

j) How can you define Global Variable and Local Variable? Also, give a   suitable C++
code to illustrate both.   2

Q5 : a) Write a program to print the left and right diagonal element of an NXN matrix   4
   b) b. Write a program to find the factorial of a number recursive function.   4
   c) Write a program to find the total number of characters, lines and words in a
       paragraph of text.   4
   d) Write a program to sort an array on N numbers in ascending order. Avoid
       duplication of elements.   4
   e) Write a program to find the roots of a quadratic equation.   4

Answer Key

Q.No.1

a. My Computer is used to viewing the contents of a single folder or drive. Also the things we have on our computer – Your Programs, Documents and data files, for example- are all accessible from form one place called My Computer.

b. Types of operating system -
   i. Single User ii. Multiuser iii. Time Sharing   iv. Real Time v. Multiprocessing vi. Interactive

c. An operating system is a program which acts as an interface between a user and the Hardware. Functions- i. Process Management and Storage(Memory) Management.
   Note. Students has to explain both in brief

d. An interpreter converts source program(HLL) into object program(LLL) line by line whereas compiler converts source program into object program in one go and once the program is error free it can be executed later .

Q.No.2

a. An error in logic or arithmetic that must be detected at run time is called run time   error. For example any number is divided by zero (c=a/0) is run time error

b. if statement can perform only true condition and there is no option for false condition while if-else statement can perform both true as well as false condition . Example,
   if(a<b) cout<<" a is greater than b" – in this code for false condition no statement is given
   if(a<b) cout<<" a is greater than b"
     else
          cout<<" b is greater than a" – here for both option either true or false output will come

c.

d. Comments in c++ can be given in two way
   Single line comment – which can be given by using the symbol - //
       Example- // Program to find the sum of two numbers
        And Multi line comment – which can be given by using the symbol /*…………*/
     Example -- /* this is the way
                 To give multiline Comment */

e. Header files are the files in which some pre – programed program will be stored by the developer of the language which will help the user of to develop their program. If the header file is written in angular bracket(<>) compiler will search it in C++ library only while in case of " " the header file will be searched throughout the database.

Q.No.3

a. i , ii ,v , vi – are invalid & iii, iv are valid declaration

b. m=5   ::m=5
   m=20 ::m=6
   m=7   ::m=20

c. True and false

d. String.h and stdio.h

e. The conditional operator (**? :**) is a ternary operator (it takes three operands). The conditional operator works as follows:

   - The first operand is implicitly converted to **bool**. It is evaluated and all side effects are completed before continuing.
   - If the first operand evaluates to **true** (1), the second operand is evaluated.
   - If the first operand evaluates to **false** (0), the third operand is evaluated.

The result of the conditional operator is the result of whichever operand is evaluated — the second or the third. Only one of the last two operands is evaluated in a conditional expression
 Ex.- // expre_Expressions_with_the_Conditional_Operator.cpp

```
// compile with: /EHsc
// Demonstrate conditional operator
#include <iostream>
using namespace std;
int main() {
  int i = 1, j = 2;
  cout << ( i > j ? i : j ) << " is greater." << endl;
}
```

f. Operator / is used to find the quotient while % is used to find the remainder in the c++ expression for ex.
  int a=5,b=2,c; if c=a/b the result of c will be 2 and if c=a%b; the value of c will be 1

Q.No.4
a. A function prototype is a declaration of the function that tells the program about the type of
   the value returned by the function and the number and the type of arguments.
      The prototype declaration looks just like a function definition except that it has no body.
   Ex. void abc();
b. break makes the compiler to transfer the control out of the loop...
for
{....
if
{
true/false condition
break;
}
}
here;
the control is transferred to "here"

continue makes the compiler to execute the next iteration of the loop

for
{
Condition..
continue;
****;
}

**** will not b executed and next iteration will happen
continue can be given inside an if condition

e. to j .   Do yourself.

Ans 5 :
a)
```
        #include<iostream.h>
        #include<conio.h>
        #include<iomanip.h>
        void main( )
        {
                int A[10][10];
                int i,j,N;
                clrscr( );
                cout<<"\nHow many rows and columns required for matrix: ";
```

```
                cin>>N;
                cout<<"\nEnter "<<N*N<<" elements: ";
                for(i=0;i<N;i++)
                {
                        cout<<"Enter the elements into Row "<<i+1<<": ";
                        for(j=0;j<N;j++)
                          cin>>A[i][j];
                }
                clrscr( );
        }

        cout<<"\nThe entered elements in the matrix are: \n";
        for(i=0;i<N;i++)
        {
                for(j=0;j<N;j++)
                cout<<A[i][j]<<"\t";
                cout<<endl;
        }
        cout<<"\n\n\nThe elements which are belongs to only diagonals...\n";
        for(i=0;i<N;i++)
        {
          for(j=0;j<N;j++)
            if((i==j)||((i+j)==(N-1)))
                cout<<setw(6)<<A[i][j];
           else
                cout<<" ";
                cout<<endl;
        }
        getch( );
}

 b)

#include<iostream.h>
#include<conio.h>
long f =1;
long factorial(int n)
{
  if (n==0)
    return f;
else
    f=n*factorial(n-1);
}
void main( )
{
   clrscr( );
   long num;
   cout<<"\nEnter the number to which you want to find factorial: ";
   cin>>num;
   cout<<"\nThe factorial of the number = "<<factorial(num);
   getch( );
}

 c)
#include<iostream.h>
```

```cpp
#include<conio.h>
#include<stdio.h>
void main( )
{
 char str[300];
 int i,charcount=0,words=1,lines=1;
 clrscr();
 cout<<"\nEnter the Paragraph ie message: \n";
 gets(str);
 for(i=0;str[i]!='\0';i++)
  {
      charcount++;
     if(str[i]==' ')
       words++;
    if (charcount%80==0)
      lines++;
  }
 cout<<"\nNumber of Characters in the entered message: "<<charcount;
 cout<<"\nNumber of Words in the entered message: "<<words;
 cout<<"\nNumber of Lines in the entered message: "<<lines;
 getch( );
}
```

d)
```cpp
#include<iostream.h>
#include<conio.h>
void main( )
{
        clrscr( );
        int A[20],N,i,j,temp;
        cout<<"\nEnter the number of elements:";
        cin>>N;
        for(i=0;i<N;i++)
        cin>>A[i];
        //Bubble sort technique
        for(i=0;i<N;++i)
          for(j=0;j<(N-1)-i ;j++)
            if(A[j]>A[j+1])
              {
                 Temp=A[j];
                 A[j]=A[j+1];
                 A[j+1]=Temp;
              }
cout<<"The Elements in the array after sorting…. ";
for(i=0;i<N;i++){
cout<<A[i]<<'\t';
}
```

e)

```cpp
#include<iostream.h>
#include<conio.h>
#include<math.h>
void main( )
```

```
{
 clrscr( );
 double d1,d2,b,a,c,d;
 cout<<"\nEnter the value of b,a and c: ";
 cin>>b>>a>>c;
d=(b*b-sqrt(4*a*c));
if(d==0)
        cout<<"\nRoots are equal or distinct";
else if(d>=0)
        cout<<"\nRoots are Real";
else
{
    cout<<"\nRoots are complex..ie Imaginary";
    d1=(-b+d)/(2*a);
    d2=(b+d)/(2*a);
    cout<<"\nD1: "<<d1;
    cout<<"\nD2: "<<d2;
    getch( );
 }
}
```