ATOMIC ENERGY CENTRAL SCHOOL NO-4
RAWATBHATA
Half Yearly Examination – 2015
Model Paper

Class – XII   **Subject – Computer Science**

Time Allowed: 3hours   *Maximum Marks: 70*
Note.   *(i) All questions are compulsory.*
         (ii) Programming Language: C+ +
         (iii) This question paper contains six pages.

(a) Differentiate between a call by value and call by reference method.   **2**

(b) Observe the following C++ code and write the name(s) of the header file(s), which will be essentially required **1**
to run it in a C++ compiler.
void main()
{ char ch,str[10];
  cin>>str;
  ch=tolower(str[0]);
  cout<<str<<endl;
}

(c) What is an identifier? List the rules of naming an identifier of C++.   **2**

(d) Rewrite the following program after removing syntactical error(s) if any. Underline each correction.   **2**
#include<iostream.h>
void main
{
int x = 20;
do
{
   if (x%3=0)
   cout >> 2*x+1 >> endl;
   else
   cout >> 2*x-1 >> endl;
   x=-2;
}
while x>0
}

(e) Find the output of the following program (Assuming that all required header files are included)   **3**
   void main( )
   {
    char city[] = {"Good Luck"};
    for(int x=0;x<strlen(city);x++)
    {if(islower(city[x])
    city[x] = toupper(city[x]);
    else
    if(isupper (city[x]))
    {if(x%2==0)
     city[x] = city[x -1];
      else
     city[x]=city[x]-1;}}

```
    cout<<city <<endl;
    }
```

(f) Find the output of the following program   **2**
```
    #include<iostream.h>
    void Update(int &a, int b=10)
    { if(b%10==0)
      a+=5;
      cout<<++a<<"$"<<b++<<endl;
    }
    void Disp(int x)
    {
    if(x%3==0)
    Update(x);
    else
    Update(x,3);
    }
    void main()
    {  Disp(4);
      Update(2,20);
    }
```

(g) Give the output of the following program (Assume all required header files are included in the program).   **2**
```
void main()
{
int array[] = {2, 3, 4, 5};
int *arptr = array;
int value = *arptr; cout << value <<endl;
value = *arptr++; cout << value << endl;
value = *arptr; cout << value << endl;
value = *++arptr; cout << value << endl;
}
```

(h) Observe the following program carefully and choose the correct possible output(s) from the option i) to iv)   **2**
and justify your option.
```
    #include<iostream.h>
    #include<stdlib.h>
    const int LOW=25;
    void main()
    { randomize();
      int POINT=5,Number;
      for(int I=1;I<=4;I++)
      { Number=LOW+random(POINT);
       cout<<Number<<":";
       POINT--;
      }
    }
```
        O/P Options: i) 29:26:25:28: ii) 24:28:25:26: iii) 29:26:24:28: iv) 29:26:25:26:

                                                                                                   3
(i) Find the output of the following program (Assuming that all required header files are included)
```
    class THREE_D
    { int X,Y,Z;
      public:
```

```cpp
     void MoveIn( int Step)
      {
       X+=Step; Y-=Step;  Z+=Step;
      }
      void MoveOut(int Step)
      {
       X-=Step; Y+=Step; Z-=Step;
      }
      void Print()
      {
       cout<<X<<","<<Y<<","<<Z<<endl;
      }
    };
     void main()
     { THREE_D T1={5,10,15},T2={20,25,30},T3;
       T1.MoviIn(5);
       T2=T3;
       T2.MoveOut(2);
       T3.MoveIn(3);
       T3.Print();
       T2.Print();
       T1.Print();
      }
```

Ques 2.

(a) Define inheritance.   **1**

(b) Differentiate between OOP and procedural programming?   **2**

(c) Differentiate between a default and a parameterized constructor in context of class and object. Give suitable   **2**
example in C++.

(d) Answer the questions (i) and (ii) after going through the following class
    class Book   **2**
    {
      char B_name[20];
      char Publication[100];
      public:
      Book(Computer &obj);   // function1
      ~Computer();   //function 2
    };
(i) Write the statement(s) which will invoke the function 1.
(ii) Name the specific feature of the class shown by function 2. Also write the time of its invoked.

(e) What is a destructor? What is its significance?   **2**

(f) Define a class employee with the following specifications: **4**
private members of class employee
empno integer
ename 20 characters
basic, hra, da float
netpay float
calculate() A function to calculate basic + hra + da with float return type

3

public member function of class employee
havedata() function to accept values for empno, sname, basic, hra, da and invoke
calculate() to calculate netpay.
dispdata() function to display all the data members on the screen.

(g) What is visibility mode? What is its role?   **2**

(h) Answer the questions (i) to (iv) based on the following code :   **4**

```
class Trainer
{ char TNO[5],Tname[20],Specialisation[10]; int days;
protected :
float Remuneration;
void AssignRem(float);
public :
Trainer();
Void TEntry();
void TDisplay();
 };
class Learner : public Trainer
{ char Regno[10],Lname[20],Program[10];
protected :
int Attendance, Grade;
public :
Learner();
void Lentry();
void LDisplay(); };

class Institute : public Learner
{ char Icode[10], IName[10];
public :
Institute();
void IEntry(); void IDisplay();};
```

(i) How many bytes will be required by an object of class Institute?
(ii) Name the member functions accessible through the object of class Institute.
(iii) From the following, Identify the member function(s) that cannot be called directly from the object of class
Institute - TEntry(), LDisplay(), IEntry()
(iv)Which type of inheritance is depicted by the above example?

Ques 3.

(a) Write a function in C++ which accepts an integer array and its size as arguments and change all the even   **3**
number with twice and odd with thrice.
Example: if an array of five elements initially contains the element as
2,4,1,5,7 then the function should rearrange the array as 4,8,3,15,21

(b) From a two dimensional array A[3][3], write a user defined function to prepare a one dimensional array B[9]   **2**
that will have all the elements of A as if they are stored in column-major form .
Ex- if array A is
        1   2 3
        4   5 6
        7   8 9
The resultant array B should be 1 4 7 2 5 8 3 6 9

(c) An array A[15][20] is stored in the memory along the column with each element occupying 4 bytes. Find out   **3**

address of the element A[10][5] if the element A[12][15] is stored at the address 9000.

(d) Define a function Reversearray(int [], int) that would accept a one dimensional integer array NUMBERS and its size N. The function should reverse the contexts of the array without using any second array. **3**
Note. Use the concept of swapping elements.
(Example : If the array initially contains
{2, 15, 3, 14, 7, 9, 19, 6, 1, 10},
then after reversal the array should contains
{10, 1, 6, 19, 9, 7, 14, 3, 15, 2})

(e)Write a function in C++ to sort employee record according to the e_no using insertion sort represented by the structure. **3**
struct emp{
char e_name[10];
int e_no;
float salary;
};

(f) Define self-referential structure with an example. **2**

(g) Evaluate the following postfix expression using a stack and show the contents of stack after execution of each operation: **2**
(A+B)^C-(D*E)/F

(h) Write a function pushbook() in C++ to perform insert operation on a dynamic queue, which contains book_no and book_title. Consider the following definition of NODE while writing your C++ code. **4**
struct Node{
char book_no;
char book_title[20];
Node *Next;
};

Ques 4.

(a) Observe the program segment given below carefully, and answer the question that follows: **1**
class Book
{
int Book no;
char Book_name[20];
public:
//function to enter Book details
void enterdetails();
// function to display Book details
void showdetails();
//function to return Book_no
int Rbook_no (){return Book_no;}
} ;
void Modify(Book NEW)
{
fstream File;
File.open("BOOK.DAT",ios::binary|ios::in|ios::out);
Book OB;
int Recordsread = 0, Found = 0;

```cpp
while (!Found && File.read((char*)&OB, sizeof (OB)))
{
Recordsread ++ ;
if (NEW.RBook_no() = = OB.RBook_no))
{
_____ //Missing Statement
File.write((char*)&NEW, sizeof (NEW));
Found = 1;
}
else
File.write((char*)&OB, sizeof(OB));
}
if (! Found)
cout<<" Record for modification does not exist";
File.close();
}
```

If the function Modify( ) is supposed to modify a record in file BOOK.DAT with the values of Book NEW passed to its argument, write the appropriate statement for **Missing Statement** using seekp( ) or seekg( ), whichever needed, in the above code.

(b) Write a function in C++ to count and display the number of line starting with alphabet 'T' or 't' present in a text file "LINES.TXT".

2

(c) What are the different ways of detecting end-of-file? Explain with suitable examples.

2

(d) Differentiate between get() and getline() function with an example.

2

(e) Given a binary file STUDENT.DAT, containing records of the following class Student type.

3

```cpp
class Student
{
char S _Admno[lO]; //Admission number of student
char S_Name[30]; //Name of student
int Percentage; //Marks Percentage of student
public:
void EnterData()
{
gets(S_Admno);gets(S_Name);cin>>Percentage;
}
void DisplayData()
{
cout<<setw(12)<<S_Admno;
cout<<setw(32)<<S_Name;
cout<<setw(3)<<Percentage<<endl;
}
int ReturnPercentage(){return Percentage;}
};
```

Write a function in C++, that would read contents of file STUDENT.DAT and display the details of those Students whose Percentage is above 75.

------Best Of Luck------