

Half- Yearly Examination, 2010-11

Subject: Computer Science (083)

Class: XII

Time Allowed: 3 Hours

Max. Marks: 70

Instructions:

- i) Attempt all questions.
- ii) Programming language: C++.
- iii) Please check that this question paper contains 7 questions.
- iv) Please write down the complete serial number of the question before attempting it.

(1). (a) What is the difference between #define and const? Explain with suitable example. **2**

(b). Differentiate between global & local variable with a suitable example in C++. **2**

(c). Name the Header file(s) that shall be needed for successful compilation of the following C++ code? **1**

```
void main()
{
    char st[20];
    cin.getline(st,15);
    if(islower(st[0]))
        cout<<"Starts with alphabet";
    else
        cout<<strlen(st);
}
```

(d). Rewrite the following program after removing the syntactical errors(s), if any. Underline each correction. **2**

```
#include<iostream.h>
#define SIZE =10
void main()
{
    int a[SIZE]={ 10,20,30,40,50};
    float x=2;
    SIZE=5;
    for(i=0,i<SIZE;i++)
        cout<<a[i]%x ;
}
```

(e). Write the output of the following program: **2**

```
#include<iostream.h>
int g=20;
void func(int &x,int y)
{
    x=x-y;
    y=x*10;
    cout<<x<<" "<<y<<'\n';
}
void main()
{
    int g=7;
    func(g,::g);
}
```

```

        cout<<g<<">,"<<::g<<'\n';
        func(::g,g);
        cout<<g<<">,"<<::g<<'\n';
    }

```

(f) Observe the following program carefully & choose the correct possible output from the options (i) to (iv), justifying your answer. 2

```

#include<iostream.h>
#include<conio.h>
#include<stdlib.h>
void main( )
{
clrscr( );
randomize( );
int RN;
RN=random(4)+5;
for(int i=1;i<=RN;i++)
cout<<i<<" ";
getch( );
}

```

i) 0 1 2 ii) 1 2 3 4 5 6 7 8 iii) 4 5 6 7 8 9 iv) 5 6 7 8 9 10 11 12

(2). (a) "While implementing encapsulation, abstraction is also implemented". Comment. 2

(b) Why do you think function overloading must be part of OOPs? 2

(c). Rewrite the following program after removing the syntactical errors(s), if any. Underline each correction. 2

```

#include<iostream.h>
class FLIGHT
{
    long FlightCode;
    char Description[25];
public
    void AddInfo( ){cin>>FlightCode; gets(Description);}
    void ShowInfo{ cout<< FlightCode<<":."<<Description<<endl;}
};
void main()
{
    FLIGHT F;
    AddInfo.F();
    ShowInfo.F();
}

```

(d). Write the output of the following program: 2

```

#include<iostream.h>
#include<ctype.h>
void mycode(char msg[ ], char ch)
{
    for (int cnt=0;msg[cnt]!='\0';cnt++)
        { if (msg[cnt]>='B' && msg[cnt]<='G')
            msg[cnt]=tolower(msg[cnt]);
          else
            if (msg[cnt]=='A' || msg[cnt]=='a')

```

2

```

        msg[cnt]=ch;
    else
        if (cnt%2==0)
            msg[cnt]=toupper(msg[cnt]);
        else
            msg[cnt]=msg[cnt-1];
    }
}
void main( )
{
    char mytext[]="ApEACeDriVE";
    mycode(mytext,'@');
    cout<<"new text:"<<mytext<<endl;
}

```

(e). Write the output of the following program segment:

3

```

#include<iostream.h>
struct package
{
    int length, breadth, height;
};
void occupies(package m )
{
    cout<<m.length<<"x" <<m.breadth<<"x"<<m.height<<endl;
}
void main( )
{
    package p1={ 100, 150,50}, p2,p3;
    ++p1.length;
    occupies(p1);
    p3=p1;
    ++p3.breadth;
    p3.breadth++;
    occupies(p3);
    p2=p3;
    p2.breadth+=50;
    p2.height--;
    occupies(p2);
}

```

(3). (a) Differentiate between *default* & *parameterized* constructor with suitable example. 2

(b) What is the significance of private, protected and public access specifiers in a class? 2

(c) Answer the questions (i) and (ii) after going through the following class. 2

```

class player
{
    int health;
    int age;
public:
    player( ) { health=6; age=18; } //Function 1
    player(int s, int a) { health =s; age = a ; } // Function 2
    player( player &p); // Function 3
    ~player( ) { cout<<"Memory Deallocate"; } // Function 4
}

```

3

```
};
void main( )
{
    player p1(7,24);    //Statement1
    player p3 = p1;    //Statement3
}
```

(i) When p3 object created specify which constructor invoked and why? Write complete definition for Function 3?

(ii) Which concept of C++ is demonstrated by Function 1, 2 and 3? Write the calling statement of Function 1.

(d). Define a class **BALANCED_MEAL** in C++ with following description: **4**

Private Members:

Access_no	Integer
Name_of_Food	String of 25 characters
Calories	Integer
Food_type	String
Cost	Float
AssignAccess()	Generates random numbers between 0 to 99 and return it.

Public Members

A function **INTAKE()** to allow the user to enter the values of Name_of_Food, Calories, Food_type, cost and call function **AssignAccess()** to assign Access_no.
A function **OUTPUT()** to allow user to view the content of all the data members, if the Food_type is Fruit.

(e). Define a class **Employee** in C++ with the following specification: **4**

Private Members:

- ename an array of char of size[50] (represent employee name)
- deptname an array of char of size[20] (represent department name)
- salary integer (represent total salary of an employee)
- bonus float
- CalBonus() This function calculate the total bonus given to an employee according to following conditions

Deptname	Bonus
Accounts	4 % of salary
HR	5% of salary
IT	2% of salary
Sales	3% of salary
Marketing	4% of salary

Public Members:

- Constructor to initialise ename and deptname to NULL and salary and bonus to 0.
- A function read_info to allow user to enter values for ename, deptname, salary & Call function CalBonus() to calculate the bonus of an employee.
- A Function disp_info() to allow user to view the content of all the data members.

(4). (a) What do you mean by memory leaks? What are possible reasons for it? How can memory leaks be avoided? **2**

(b). Write the output of the following program segment: **3**

```
#include<iostream.h>
void main()
{
```

```

int Numbers[] = {2,4,8,10};
int *ptr = Numbers;
for (int C = 0; C<3; C++)
{
cout<< *ptr << "@";
ptr++;
}
cout<<endl;
for(C = 0; C<4; C++)
{
(*ptr)*=2;
--ptr;
}
for(C = 0; C<4; C++)
cout<< Numbers [C]<< "#";
cout<<endl;
}

```

(5). (a) Consider the following declarations and answer the questions given below: 4

```

class RED
    {      char n [ 20 ];
    void input ( );
protected:
    int x , y ;
    void read ( );
public:
    RED ( );
    RED ( int a );
    void get_red ( );
    void put_red ( );
};
class WHITE : protected RED
{      int a , b ;
protected :
    int c , d ;
    void get_white( );
public:
    WHITE ( );
    void put_white ( );
};
class BLACK : private WHITE
{      char st[20];
protected :
    int q;
    void get_black( );
public:
    BLACK ( );
    void put_black ( );
}ob;

```

- i. Name the data members and member functions which are accessible by the object **ob**.
- ii. Give the size of object **ob** and class **WHITE**.
- iii. Name the OOPS concept implemented above and its type.

iv. Name the members accessible by function `get_black()`.

(b). Can a derived class get access privilege for a private member of the base class? If yes, how? 2

(6). (a) Name two modes common to classes `ifstream` and `ofstream`? 1

(b) Write a user defined function in C++ to read the content from a text file “MYBOOK.TXT” and count & display the number of word “India” present in the file. 2

(c). Following is the structure of each record in a data file named “COLONY.DAT” 3

```
struct Colony
{
    char colony_code[10];
    char colony_name[10];
    int no_of_people;
};
```

Write a function to update the file with a new value of `no_of_people`. The value of `colony_code` and `no_of_people` are read during the execution of the program.

(d). Write a function to count the number of VOWELS present in a text file named “PARA.TXT”. 2

(e). Observe the program segment given below carefully and fill the blanks marked as Statement 1 and Statement 2 using `seekp()` and `seekg()` functions for performing the required task. 1

```
#include <fstream.h>
class Item
{
    int Ino;char Item[20];
public:
    //Function to search and display the content from a particular //record number
    void Search(int );
    //Function to modify the content of a particular record number
    void Modify(int);
};
void Item::Search(int RecNo)
{
    fstream File;
    File.open(“STOCK.DAT”,ios::binary|ios::in);

    _____
    //Statement 1
    File.read((char*)this,sizeof(Item));
    cout<<Ino<<”==>”<<Item<<endl;
    File.close();
}
void Item::Modify(int RecNo)
{
    fstream File;
```

```
File.open("STOCK.DAT",ios::binary|ios::in|ios::out);
cout>>Ino;cin.getline(Item,20);
```

```

    _____
    //Statement 2
File.write((char*)this,sizeof(Item));
File.close();
}

```

(7). (a). Write a function in C++ which accepts an integer array and its size as arguments and exchanges the values of first half side elements with the second half side elements of the array. 4

Example : If an array of 8 elements initial content as 2, 4, 1, 6, 7, 9, 23, 10
The function should rearrange array as 7, 9, 23, 10, 2, 4, 1, 6

(b). An array MAT [15] [7] is stored in the memory along the column with each element occupying 2 bytes of memory. Find out the base address and the address of element MAT[2] [5], if the location of MAT [5] [4] is stored at the address 100. 4

(c). Write a user defined function in C++ which accepts a squared integer matrix with odd dimensions (3*3, 5*5 ...) & display the sum of the middle row & middle column elements. For eg.: 4

2	5	7
3	7	2
5	6	9

The output should be:

Sum of middle row = 12
Sum of middle column = 18

(d). Write a function LowerHalf () which takes a two dimensional array A, with size N rows and N columns as argument and point the lower half of the array. 2

Eg: If A is	2 3 1 5 0	The output will be	2
	7 1 5 3 1		7 1
	2 5 7 8 1		2 5 7
	0 1 5 0 1		0 1 5 0
	3 4 9 1 5		3 4 9 1 5



“LIFE and TIME are two great teachers. LIFE teaches you the use of TIME and TIME teaches you the value of LIFE”.

Best of Luck