→ copy - 1 (Swati)

ST-G 10/2014

SUBJECT : COMPUTER SCIENCE (SET-II)

Time allowed: 3 Hrs **Maximum Marks: 70**

Instructions:

(i) All the questions are compulsory

(ii) Programming Language C++

Q1. (a) Write the names of the header files which are necessary to execute the following C++ code [1]

```
#include<iostream.h>
void main()
{
        int n,m;
        cin>>n>>m;
        cout<<setw(10)<<pow(m,n);
}
```

(b) Differentiate between the global variable and local variable. Also give suitable C++ code to illustrate both. [2]

(c) Rewrite the corrected code for the following program. Underline each correction (if any). [2]

```
#include <iostream.h>
struct Room;
{
        Int Rcode;
        char Type[5];
        float length, breath height;
};
void main()
{
        Room R;
        R. Rcode=101;
        R.type=" Double";
        R.length=breath=height=20;
```

```
    cout<<R.Rcode<<','<<R.Type<<'\n,'
    <<R.length<<','<<R.breath<<','<<R.height;
}
```

(d) Find the output from the following code: (2)

```
#include <iostream.h>
void main()
{   int a[ ]={50,100,150,200,250};
    int *p=a;
    for(i=0; i<4;i+=2)
    {
        *(p+i)=*(p+i)+10;
        cout<<* (p+i) <<'$';
        p++;
    }
    cout<<endl;
    for(i=0;i<5;i++)
        cout<<a[i]<<'#';
}
```

(e) Observe the following program and find out, which option or options out of (i) to (iv) will be expected output(s) from the program? Justify your answer. [2]

```
#include<iostream.h>
#include<stdlib.h>
void main()
{
    char col[][10]=
    {"Rose","White","Yellow","Green"};
    randomize();
    for(int i=0; i<4; i++)
    {   int t=random(sizeof(i))+1;
        cout<<col[t]<<'$';
    }
}
```

(i) Rose$White$Yellow$Green$

(ii) Yellow$White$Rose$Yellow$

(iii) White$Yellow$Yellow$White$

(iv) Green$Yellow$White$Rose$

(f) Give the output of the following program (Assuming that all required header files are included in the program) : [3]

```
#define i 5
class TEMP
{       int a;
        float b;
        public:
        TEMP( )
        {a=5;
        b=10; }
        void INTEMP( )
        { a++;
        b=a+10; }
        void OUTTEMP( )
        { cout<<a*i<<"$"<<b-3<<endl; } };

        void main()
        { TEMP ob[6];
        for(int x=0;x<6;x++)
                ob[x].INTEMP( );
        for(x=0;x<6;x++)
                ob[x].OUTTEMP( );
        }
```

Q2. (a) Differentiate between private and public visibility mode. (2)

(b) Define a class Eshop with following descriptions: (4)

Private members:

Code of type integer.
Type of type string.
Price of type float.
Qty of type integer.

Public members:

- A constructor to assign initial values of Code as 111, Type as "Gold", Price as 3000 and Qty as 0.

- NewShop() - A function to accept Code, Type and Quantity and call Assign() function.
- Assign() -To allocate Price value based upon type

Type	Price
Platinum	5000
Gold	3500
Silver	1000

- ShowShop() - A function to display Code,Type,Price and Qty on screen.

(c) Given the following C++ code, answer the questions (i) and (ii). [2]

```
class stream
{       int Scode;
        char Sname[20];
public:
        stream()                    //Function1
        {
                Scode=111;
                Strcpy(Sname,"Science");
        }
        stream(stream &s);          //Function2
        stream(int sl,char s2[]);   //Function3
        ~stream ( );                //Function4
};
```

(i) Which OOPs concept is implemented in Function1,2 &3 ? Write the statement to call function 3.

(ii) Write the definition of Function2. What is the purpose of this function?

(d) Answer the following (i) to (iv) based on the following code. [4]

```
class Country
{       int Ccode;
        char Cname[25];
```

```
protected:
        void Register();
public:
        country();
        void Incountry();
        void Outcountry();
};
class State: private Country
{
        int Scode;
        char Sname[25];
protected:
        int NOM;
public:
        State();
        void Instate();
        void Outstate();
};
class City: public State
{
        int Code;
        char name[20];
protected:
        int population;
public:
        City();
        void Incity();
        void Outcity();
};
```

(i) Write the names of member functions, which are accessible from object belonging to class city.

(ii) How many bytes will be required by an object belonging to class City and State.

(iii) Write the names of all members, which are accessible from member function of class City.

(iv) Which type of inheritance is depicted in the above example?

Q3. (a) Write a function PrintPrime(int a[],int n) in C++, to pass array 'a' and size 'n' and to print all prime numbers on the output screen. [3]

For example:

Input array value is

10,5,7,25,30,31

Output is:

5,7,31

(b) Write a function CreateDouble(int n) in C++ to create two dimensional array with nXn matrix in the following format. [2]

Ex:

n=3

10	20	30
10	20	0
10	0	0

n=5

10	20	30	40	50
10	20	30	40	0
10	20	30	0	0
10	20	0	0	0
10	0	0	0	0

(c) An array H[1..40][1..20] is stored in the memory along the column with each of the element occupying 4 bytes, find out the address H[30][10], if an element H[2][20] is stored at the memory location 4000. [3]

(d) Write a C++ class definition to implement dynamic stack. Each node of the stack contains the information of following player structure. [4]

```
struct player
{
    int pcode;
    char name[20];
    player *link;
};
```

Implement push() and pop() operation inside the class.

(e) Complete the following infix expression to postfix expression a/b*c↑(d*e)/f [2]

Q4. (a) Observe the program segment carefully and answer the questions that follow. [1]

```
class Product
{
        int Pcode;
        char Pname[20];
public:
        void enterdetail();
        void showdetail();
        void getProduct_no() { return Pcode; }
};
void modify(Product P, int y)
{
        fstream File;
        File.open("product.dat",ios::binary|
        ios::in| ios::out); Product p1;
        int rcount=0,found=0;
        while(!found && File.read((char
        *)&p1,sizeof(p1)))
        {
                rcount++;
                if(p1.getProduct_no()==y)
                {
                _____//Statement 1
                _____//Statement 2
                found=0;
        } }
        if (! found)
        cout<<"Record not found";
        File.close();
}
```

If the function modify() is supposed to modify a record in the file "product.dat", which Pcode is 'y' with the values of product 'P' passed as arguments. Write the appropriate statement1 using seekp() or seekg() and write statement 2 to write new product information (P) to the file product.dat.

(b) Assuming that a text file "para.txt" already contains some text written into it, write a function name

count_letter_word(), that reads the file "para.txt" word by word and display word with number of characters.

For example: [2]

If the file para.txt contains

"Carry books and pen when you go to school".

Output is:

Carry 5

books 5

and 3

pen 3

And so on.

(c) Assuming the class stream as follows: [3]

```
class stream
{
        int sno;
        char sname[20];
public:
        void getdata()
        {
                cin>> sno;
                gets(sname);
        }
        void putdata();
        {
                cout<<sno;
                cout<<sname;
        }
        char *getname()
        {       return(sname);
        }
};
```

Write a function in C++ to search for a subject science stream from a binary file "stream.dat" (containing the object of class stream) and display its details on the output screen.

Q5. (a) What do you understand by the term candidate key and alternate key. Illustrate with an example. [2]

(b) Consider the following tables students and streams and answer (I) and (II).

Students

Adno	Name	Average	Sex	Scode
501	R.Jain	98	M	111
545	Kavita	73	F	333
705	K.Rashika	85	F	111
754	Rahul Goel	60	M	444
892	Sahil Jain	78	M	333
935	Rohan Saini	85	M	222
955	Anjali	64	F	444
983	Sneha Aggarwal	80	F	222

Streams

Scode	Sname	Place
111	Science	SBlock
222	Commerce	CBlock
333	Humanity	HBlock
444	Art	ABlock

(I) Write the commands for the following statement. [4]

(i) To display Adno,Name,Sex and Average from Students table and Stream name(Sname) and place from Stream table with respect to Scode.

(ii) Display all students information in descending order based upon Average marks.

(iii) Display number of students in each stream.

(iv) Add following information to student table. 999 Deepak Sharma 83 M 222

(II) Give the output of the following SQL queries. [2]

(i) Select sum(Average)
From students Where sex='M';

(ii) Select distinct (Scode)
From students;

(iii) Select max(scode),min(scode)
From students
Where sex='F';

(iv) select avg(average)
From students;

Q6. (a) State and verify any one associative law using truth table. [2]

(b) Reduced the following Boolean expression using K-Map.
$F(A,B,C,D) = \Pi(0,1,2,4,5,6,8,10,12,13,14,15)$ [3]

(c) Write the POS form of a following Boolean Expression.
$F(P,Q,R)=\Sigma(1,3,5)$ [1]

(d) Draw the circuit diagram using NOR gate only.
$F(X,Y,Z)=(X'+Y)(X+Y')(X'+Z')$ [2]

Q7. (a) It is a technology on computer networks whose purpose is to prevent unwanted networking connection according to some filtering/blocking rules. What is it? [1]

(b) Two neighbourhood shop, at a distance of 125 metres from each other, decided to join their LANs using cable so that they can share their business activity. But after joining their LANs, they are not able to do communication due to loss of signal. Which device should they use so that signal is amplified? [1]

(c) Which protocol is used to transfer hypertext documents on the internet? [1]

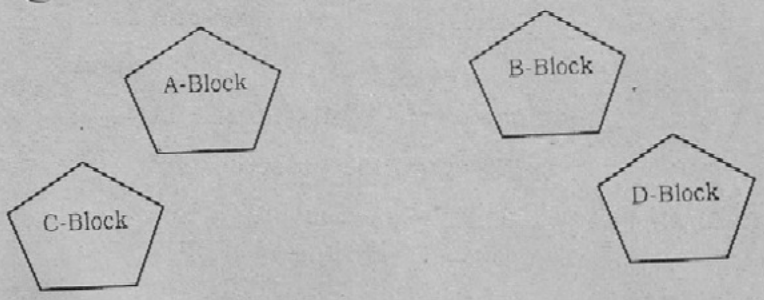
(d) Ms. Leena is confused between 'Open Source Software' over 'Proprietary Software. Mention at least one point of differences to help her understand the same. [1]

(e) What is the purpose of using a Web Server? [1]

(f) Which of the following is not a Client Side script: [1]

(i) VB Script (ii) ASP (iii) PHP (iv) Java Script

(g) The Rangoli creation has set up its new centre at Patna for its office and web based activities. It has 4 blocks of buildings as shown in the diagram given below: [4]



centre to centre distance between various blocks/ centres is as follows :

Block A to Block B	30 m
Block B to BlockC	110 m
Block C to Block D	55 m
Block A to Block D	260 m
Block B to Block D	195 m
Block A to Block C	32 m

Number of Computers in each of the Blocks is follows :

A Block	25
B Block	55
C Block	125
D Block	15

(g1) Suggest the most suitable place (i.e. Block) to install the server of this office with a suitable reason.

(g2) Suggest an ideal layout for connecting these blocks for a wired connectivity.

(g3) Which device you will suggest to be placed/installed in each of these blocks to efficiently connect all the computers with in these blocks

(g4) The office is planning to connect its admission office in the big city, which type of network out of LAN, MAN or WAN will be formed? Justify your answer.