COMPUTER SCIENCE (083)

CLASS – XII

TIME: 3 Hrs. Max Marks. – 70

General Instructions:-

(i) All questions are compulsory with all of their parts together.

(ii) Programming language : C++

(iii) Pencil work or repetition of solution is not allowed

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1 a) Differentiate between Automatic and Explicit typecasting in C++. Explain with a suitable example. [2]

b) What is difference between Actual Parameter and Formal Parameter? Give suitable example to illustrate the concept. [2]

c) What is variable scope? What is the difference between Local and Global scope? Explain with an example. [2]

d) Write the related library function based upon the given information in C++. [1]

(i) Get a line using keyboard. This function is available in stdio.h file.

(ii) To check whether given character is uppercase character or not. This function is available in ctype.h file.

e) Rewrite the following program after removing the syntactical error(s) if any. Underline each correction. [2]

```
include<iostream.h>
 #define PI=3.14
 void main( )
    {  float r;a;
       cout<<"enter any radius";
       cin>>r;
       a=PI*pow(r,2);
       cout<<"Area="<<a;
    }
```

f) Find Syntax error(s), if any, in the following program: [2]

(Assuming all desired header file(s) are already included)

```
typedef String[80] char;
void main
{
String S;
for (L=0;L<26; L++)
```

```
S [L] =L+65;
S [L] ='\0';
cout<<S<<endline;
}
```

g) Find the output of the following program segment (assume all necessary declarations are already made). [2]

```
 # include<iostream.h>
 # include<ctype.h>
 void strcon(char s[ ])
{      for(int i=0,t=0;s[i]!='\0';i++,t++) ;
         for(int j=0 ; j<t ; j++)
         {     if(isupper(s[j]))
                    s[j]=tolower(s[j])+2;
               else if (islower(s[j]))
                    s[j]=toupper(s[j])-2;
               else
                    s[j]='@';      }          }
void main( )
  {    char c[]="Julius Caesar";
       strcon(c) ;
       cout << "Text="<<c<<endl ;            }
```

h) Find the output of the following C++ program: [3]

```
# include<iostream.h>
# include<conio.h>
# include<ctype.h>
class CLASS
{
   int Cno,total;
   char section;
   public:
      CLASS(int no=1)
      {   Cno=no;
         section='A';
         total=30;
      }
void addmission(int c=20)
```

```
{      section++;
total+=c;
}
void ClassShow()
{
  cout<<Cno<<":"<<section<<":"<<total<<endl;    }      };
void main( )
{      CLASS C1(5),C2;
       C1.addmission(25);
       C1.ClassShow();
       C2.addmission();
       C1.addmission(30);
       C2.ClassShow();
       C1.ClassShow();          }
```

i) Find out the expected correct output(s) from the options (i) to (iv) for the following C++ code. Also, find out the minimum and the maximum value that can be assigned to the variable Stop used in the code: [2]

```
void main()
{ int Begin=3,Stop;
for (int Run=1;Run<4;Run++)
{Stop=random(Begin) +6;
cout<<Begin++<<Stop<<"*";
} }
```

(i) 36*46*59*

(ii) 37*46*53*

(iii) 37*48*57*

(iv) 35*45*57*

2 a) Why is a constructor function required in classes ? Illustrate with the help of a example? [2]

b) What is difference between Multilevel and Multiple Inheritance? Explain with suitable example. [2]

c) What is the relationship between a class and an object? Illustrate with a suitable example. [2]

d) How are private members different from protected members of a class? Illustrate with a suitable example. [2]

e) Answer the questions (i) to (iv) after going through the following class: [4]

```
class Book
{  int BookNo; char BookTitle[20];
public:
Book();                          //Function 1
Book(Book & ) ;                  // Function 2
Book(int,char []);        // Function 3
~Book();            //Function 4
void Buy();         //Function 5
void sell();        //Funtcion 6
};
void main()
{  ….
…..  }
```

(i) Name the feature of Object Oriented Programming demonstrated by Function1, Function2 and Function3.

(ii) Give complete function definition of Function 2.

(iii) Identify Function 4 and when does it gets invoked?

(iv) Write statements in C++ to execute the function 3 and function 5 inside the main() function.

f) Define a class travel in c++ with the following descriptions: [4]

private members

travelcode	of type long
place	of type character array(string)
season	of type character array(string)
total_fare	of type float
discount	of type float

public members:

- A constructor to assign initial values to travelcode as 101, place as "udaipur", season as "general" , total_fare = 0 , discount = 0.
- A function newtravel() which allows user to enter travelcode, place, season and total_fare. also calculates the discount on total_fare as per the following conditions:

SEASON	DISCOUNT (%)
DEEPAWALI	10
HOLI	5

CHRISTMAS	15
SUMMER	12
GENERAL	0

- A function showtravel() to display all data members on screen.

h) Consider the following class and answer the questions that follow: [4]

```
class ITEM
{ char ICode[10];
protected:
char IName[20];
public:
ITEM();
void Enter();
void Display();
};
class SUPPLIER
{
char SCode[10];
protected:
char SName[25];
public:
SUPPLIER(); void TEnter(); void Tdisplay(); };
class SHOP:private SUPPLIER, public ITEM
{ char SHOPADDRESS[15],SEmail[25];
public:
SHOP () ; void Enter( ); void Display( ); };
```

(i) Which type of Inheritance is shown in the above example?

(ii) Write the names of all the data member accessible from Enter() function of class SHOP.

(iii) Write name of all the member functions accessible through an object of class SHOP.

(iv) What will be the order of execution for the constructors ITEM(),SUPPLIER() and SHOP(),when an object of class SHOP is declared?

(d) Consider the following class *sample*: [4]

```
class sample
{ private :int x;
protected :
```

```
unsigned int c;
public :
sample()
{ c= 0;x=1; }
void change(int n)
{ x=x+n; }
int ret_c()
{ return c; }
};
```

Write code in C++ to protectedly derive another class new_sample from class sample. Class new_sample should have the following additional function members in the public visibility mode:

(i) A parameterized constructor to initialize the value of c to the value of parameter.

(ii) dec_count() to decrease the value of data member c by 1.

(iii) Reset() to set the value of data member count to 100 .

3 a) Write the definition for a function void Transfer (int A [6],int B[6]) in C++, which takes two integer arrays, each containing 6 elements as parameters. The function should exchange all odd places (lst, 3rd and 5th) of the two arrays, for example [3]

If the array A contains 15, 10, 12, 21, 52, 76

And if the array B contains 23, 41, 67, 83, 13, 53

Then the function should make the contents of the array A as 15, 41, 12, 83, 52, 53

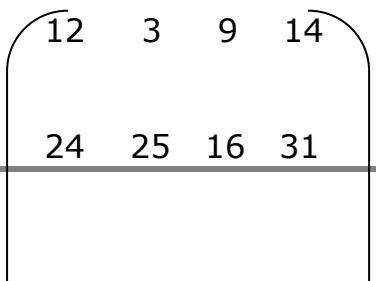
And the content of array B as

23, 10, 67, 21, 13, 76

b) An array M [18] [30] is stored in the memory along the row with each of its elements occupying 4 bytes. Find out the base address and the address of an element M [2] [5], if the M [5] [10] is stored at address 4000. [3]

C) Write a function in C++ which accepts an integer array and size as arguments and sort all the elements in ascending order using selection sort technique. [3]

c) Write a function in C++ which accepts a 2D array of integers, number of rows and number of columns as arguments and assign the elements which are divisible by 3 or 5 into a one dimensional array of integers. [3]



If the 2D array is

19 32 45 27

11 5 28 18

The resultant ID arrays is 12, 3, 9, 24, 25, 45, 9, 5, 18

d) Taruna has just started working as programmer in the JAGAT WORLD SOFTWARE company. In the company, he has got his first assignment to develop a small C++ module to find the number out of a given set of numbers stored in a one dimensional array in descending order using binary search. Somehow she has committed a few logical mistakes while writing this code and so he is not getting the desired result from the code. Find out the mistakes and correct this C++ code so that it provides the desired result (do not add any new statement in the code). Underline each correction made: [2]

```
int BSearch(int ARR[],int Size,int num)
{
int beg=0,end=Size,mid;//statement 1
while(beg>=end)//statement 2
{
mid=(beg+end)/2; //statement 3
if(ARR[mid]==num) //statement 4
return num;
else
if(ARR[mid]<num) //statement 5
beg=mid+1;        //statement 6
else
end=mid+1;       //statement 7
} return -1;   }
```

f) Write a function in C++ to find the sum of diagonal elements from a 2D array of type float. Use the array and its size as parameters with float as its return type. [2]

g) Write a function TRANSFER(int A[], int B[], int Size) in C++ to copy the elements of array A into array B in such a way that all the negative elements of A appear in the beginning of B, followed by all the positive elements, followed by all the zeroes maintaining their respective orders in array A. For example: [3]

If the contents of array A are:

7, -23, 3, 0, -8,-3,4, 0

The contents of array B should be

-23 , -8, -3, 7, 3, 4, 0, 0

4. a). Write a function in C++ which will increase the qty of a particular type of item from the file "stock.dat" assuming that the binary file is containing the records of following structure: [3]

```
struct products
{       int id; char iname[30]; int type; int qty;  };
```

Accept the item type and qty to be increased from user whose qty has to be increased.

b) Write a function to *display* a record on the given *model number* for a *TV* from the binary file *"TV.DAT"* containing the objects of *TV* (as defined below): [3]

```
class TV
{
long model;
float size;
char brand[30],comp[30];
 public:
long retmodel( )
{ return model; }
void Input( ) {cin>>model>>size; gets(brand); gets(comp); }
void  Output( ) { cout<<model<<size<<brand<<comp<<endl; } };
```

c) Given a binary file SCHOOL.DAT, containing records of the following structure type. [3]

```
class School
{       private: char schoolname [20]; char teachernames [10] [30];
public: void getdata() ; void putdata();
char *ret_schoolname() { return schoolname;}   };
```

Write a function in C++ that would read contents from the file SCHOOL.DAT and creates a file named CBSE.DAT copying only those records from SCHOOL.DAT where the school name is "KVHLD"

**********Best of Luck**********