SAMPLE PAPER – 2014
Computer Science (083)
CLASS – XII

Time allowed : 3 hours   **Maximum marks : 70**

Note :
   i)   **All the questions are compulsory .**
   ii)   **Programming Language : C++ .**

1.(a) What are the differences between a data type struct and a data type class in c++ ?   2

  (b) Write the names of header files, which are NOT necessary to run the following program: 1

```
#include <iostream.h>
#include <stdio.h>
#include <string.h>
#include <math.h>
void main()
{
 char STR[80];
gets(STR);
 puts(strrev(STR));
}
```

(c) Gunjan has just started working as programmer in the ZEE WORLD SOFTWARE company. In the company, he has got his first assignment to develop a small C++ module to find the biggest number out of a given set of numbers stored in a one dimensional array. Somehow he 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 BIGFIND(int ARR[],int Size)
{
        int BIG=ARR[1];        //Statement 1
   for (int C=2;C<Size;C++)        //Statement 2
        if (ARR[C]<BIG)          //Statement 3
              ARR[C]=BIG;        //Statement 4
     return BIG;                //Statement 5
}
```

(d) Observe the following program & Find out the correct possible outputs from the options .
    (Assuming that all required header files are included in the program)   2

```
void main()
{
 char  serial[ ] =  { 'E', 'X','A','M'};
        int number [ ]= { 69,66,67,68};
    randomize();
cout<<number[random(3)];
  for( int i=0;i<4;i++)
  cout<<serial[sizeof(int) + random(2)-1];
}
```

       (i) 67XXAX   (ii) 69AXXA   (iii) 66AAXA   (iv) 67AAAM

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(e) Find the output of the following program segment (Assuming that all required header files are included in the program   2

```
void main()
{
 char *text[2]={"TWO", "SIX"};
 for(int c=0;c<2;c++)
 {
    for(int d=0;d<strlen(text[0]);d++)
       if(islower(text[c][d]))
              cout<<(char) toupper(text[c][d]);
     else  if(isupper(text[c][d]) &&(d%2==0))
              cout<<(char) tolower(text[c][d]);
        else   text[c][d] ;
                    cout<<d <<endl ;
     }
 }
```

(f) Find the output of the following program segment (Assuming that all required header files are included in the program   2

```
 void main()
 {
  char Text[ ]="TALenT@orG";
   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 ;
  }
```

2(a). What is the importance of constructor in OOP ? Explain it with example .   2

   (b) Define a class **MARKER** with the following specifications :   4
        Private members: product_code character(6) , brand_name   character(15)
       Price float , Product_type   character(L-long , S-short) , category character(20)
        Public members: A **constructor** to assign initial values of product_code as ST200,
                   brand_name as "SONY" , product_type as 'L' and price as 10000 .
 Another constructor which takes initial values as parameters and assigns them to the respective member data .
A function **det()** which calculates category of the product based on the following calculations :

Price	category
<10000	Economy
>=10000 but <30000	Elegent
>=30000	Luxury

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(c) Consider the following **class *counter*:**   3

     class counter
     { protected : unsigned int count;
     public : counter()
          { count = 0; }
     void inc_count()
     { count++; }
       int get_count()
       { return count; }
     };

Write code in C++ to publically derive another class new_counter from class counter. Class new_counter should have the following additional function members in the public visibility mode:

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

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

(iii) Reset() to set the value of data member count to 0.

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

     class DRUG
          { char catg[10];
           char DOF[10], comp[20];
          public:
              DRUG( );
              void endrug( );
              void showdrug( );
          };
              class TABLET : public DRUG
                 { protected:
                    char tname[30],volabel[20];
                 public:
                    TABLET( );
                    void entab( );
                    void showtab( );
               };
     class PAINKILLER : public DRUG
          { int dose, usedays;
         char seffect[20];
           public :
               void entpain( );
               void showpain( );
         };

i)   How many bytes will be required by an object of TABLET?

ii)   Write names of all the member functions of class PAINKILLER.

 iii)   Which type of inheritance this is ?

iv)   Name the member function accessible by object of PAINKILLER , when TABLET will
      be derived publicly and DRUG protectedly ?

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3.(a)Write a function in C++ which accepts an integer array and its size as arguments / parameters
and arrange all the even numbers in the first row and odd numbers in the second row
of a two dimensional array as follows. The unused cells of two dimensional array must
be filled with 0. 3
If the array is 1, 2, 3, 4, 5, 6
The resultant 2-D array is given below

2	4	6	0	0	0
0	0	0	1	3	5

(b) An array A[2….5][-1….3] is stored in the memory along the column with each element occupying 4
bytes. Find out the Base address and address of the element A[3][7] if the element A[4][4] is stored at the
address 1300. 4

(c)Write a function in C++ to delete a node containing names of student ,from a static allocated circular
queue of names implemented with the help of following structure : 3

```
struct student
{
        char name[20];
        student *next;
};
```

(d) 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: If the contents of array A are: 2
7, -23, 3, 0, -8,-3,4, 0
The contents of array B should be
-23 , -8, -3, 7, 3, 4, 0 ,0

(e) Evaluate the following postfix expression showing the stack status : 2
     False , True , NOT , OR , True , False , AND , OR

4. (a) Observe the following program carefully and fill in the blanks using seekg( ) and tellg( ) functions :
1

```
#include<fstream.h>
class school
{ private :
        char scode[10],sname[30];
        float nofstu;
        public:
                void INPUT( );
                void OUTPUT( );
                int COUNTREC( ); };
        int school::COUNTREC( )
                { fstream fin("scool.dat",ios::inlios::binary);
                _____ //statement 1
                int B=_____ //statement 2
```

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```
                int C=B/sizeof(school);
                fin.close( );
                return C; }
```

(b) Assume that a text file named "**ALPHA.TXT**" already contains some text written into it . But while writing into the file , the word **"are"** has been misspelled **"aer"** everywhere in the file . Write a function named Rectify() in c++ that reads the file "ALPHA.TXT" and corrects the word **"aer"** .   2

(c) Given a binary file EMPLOYEE.DAT containing records of the following type :   3

```
   class Emp
   {  char ename[20], status ;
      int eid ;
       public: void read();
               void show();
           char getstatus()
           {  return status ;
              }
       void setstatus(char s)
       { status = s;
          }
     int getid()
     { return id;  } };
```

Write a function which changes the status of all Employee with previous status as 'A' to 'B' .

5. (a) What do you understand by Primary Key.   2

(b) Consider the following tables **TOURIST** and **PLACE**. Write **SQL** commands for the statements
     (i) to (vi) and give outputs for SQL queries (vii) to (x)   8
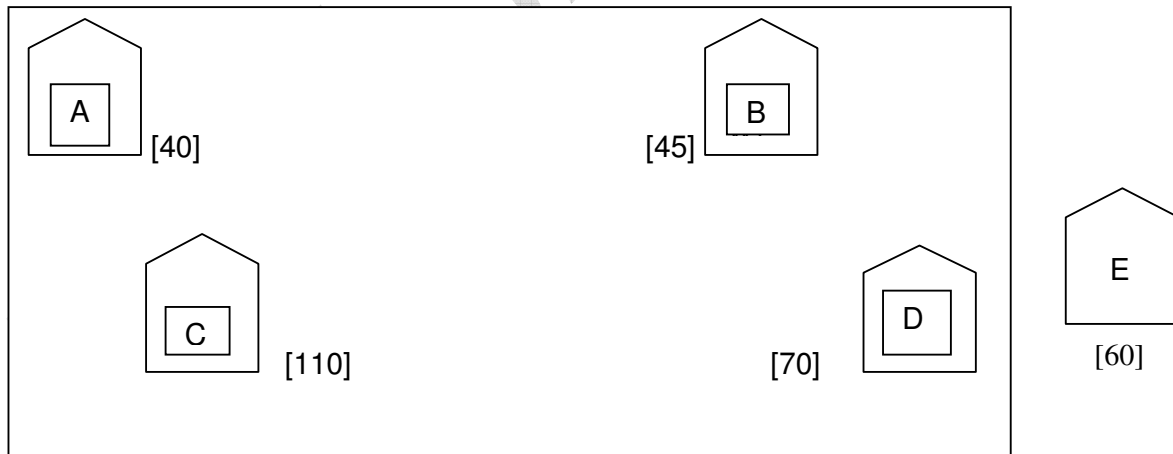
Table : TOURIST

Pcode	TouristName	Agency	No-of_person	Tourdate
P5	Hena	Grand	2	15-JAN-08
P2	Deep	KingsFerry	4	05-JUNE-12
P5	Shamresh	Shree Ganesh	6	12-AUG-10
P6	Harry	KingsFerry	2	03-FEB-13
P3	Sumit Mittal	Grand	4	06-JAN-11
P6	Jyoti	Shree Ganesh	4	07-SEPT-08
P1	Veena	ShreeLaxmi	12	18-MAR-08
P1	Rajiv	Grand	5	15-NOV-13

Table : PLACE

Pcode	Placename	Amount
P1	Puri	5000
P2	Haridwar	20000
P3	Brindaban	15000
P4	Badrinath	25000
P5	Dwarka	22000
P6	Rameswar	25550

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(i) Display the name of all the tourists , their traveldates , name of places they are travelling to
and the total amount to be paid by each tourist .

(ii) Display the maximum No-of-persons travelling of each travel agency .

(iii) To list the names of those tourists only whose name starts with 'H' .

(iv) Arrange the contents of the table tourist in ascending order of Tourdate .

(v) To delete the details of Deep .

(vi) To display the Agency , Touristname & Place of the Tourist Whose amount is above 15000.

(vii) Select Touristname from TOURIST where Amount=(select max(Amount) from PLACE) where
TOURIST.Pcode= PALCE.Pcode ;

(viii) select count(No_of_person) from Tourist ;

(ix) select distinct(Agency) from Tourist;

(x) select Agency , sum(No-of_Person) from TOURIST group by agency
having Sum(no-of_person) >10 ;

6 .(a) State and prove the Demorgan's law using truth table .   2

(b) Write the equivalent POS expression of following SOP form

   F (x,y,z)= $\sum$ (0,2,4,6)   1

(c) Draw the Logical circuit of the x+yz with the help of NAND gate only   1

(d) Obtain the simplified form of a Boolean expression using K-Map.   3

   F(a,b,c,d)= π (2,3,5,7,9,10,11,12,15)

(e) Prove that [(x+y)' + (x+y)']' = x+y   1

7. (a) Expand   a) CDMA   b) WLL   1

(b) Name the most important and safest network security technique .   1

(c) A company has decided to network all its offices spread in 5 buildings as shown .   4

A [40]   B [45]

C [110]   D [70]   E [60]

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Centre to centre distance
Between various Blocks

[ ] indicates the number of computers contained by each block

Pcode	Amount
A and B	20m
B and C	150m
C and D	70m
C and E	5000Km
A and D	165m
B and D	90m
B and E	5000Km

i) Suggest a suitable Network connection with topology .

ii) Where do you think repeaters and modem should be kept ?

iii) Suggest an economic technology to provide internet accessibility to all wings .

iv) Building C has to be used for critical operations . It wants its PC to get maximum bandwidth .

    Which network device should be used for this ?

d) Differentiate between freeware and open source software .   1

e) Differentiate between Virus and Antivirus .   1

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