CBSE AISSCE 2010 Marking Scheme for Computer Science

(Sub Code: 083 Paper Code 91/1 Delhi)

General Instructions:

- The answers given in the marking scheme are SUGGESTIVE, Examiners are requested to award marks for all alternative correct Solutions/Answers conveying the similar meaning
- All programming questions have to be answered with respect to C++ Language only
- In C++, ignore case sensitivity for identifiers (Variable/Functions/Structures/Class Names)
- In SQL related questions - both ways of text/character entries should be acceptable for Example: "AMAR" and 'amar' both are correct.
- In SQL related questions - all date entries should be acceptable for Example: 'DD-Mon-YY', "DD/MM/YY", 'DD/MM/YY', "MM/DD/YY", 'MM/DD/YY' and {MM/DD/YY} are correct.
- In SQL related questions - semicolon should be ignored for terminating the SQL statements
- In SQL related questions, ignore case sensitivity.

1	(a)	What is the difference between automatic type conversion and type casting? Also, give a suitable C++ code to illustrate both.	2

	Ans	**Automatic Type Conversion: It is an implicit process of conversion of a data from one type to another. For example**
		`int N = 65;`
		`char C = N; // Automatic type conversion`
		`cout<<C;`
		OUTPUT:
		`A`
		Type Casting: It is an explicit process of conversion of a data from one type to another. For example
		`int A=1, B=2;`
		`float C = (float)A/B; //Type Casting`
		`cout<<C;`
		OUTPUT:
		`0.5`	

		(½ Mark for each correct explanation of Automatic Type Conversion and Type Casting) *(½ Mark for each correct example of Automatic Type Conversion and Type Casting)* *OR*	

		(Full 2 Marks for correct example(s) demonstrating the meaning of / difference between Automatic Type Conversion and Type Casting) OR ***(Only 1 Mark to be awarded if Explanation without supporting examples)*** Note: Output is optional	

	(b)	Which C++ header file(s) will be essentially required to be included to run/execute the following C++ code?
		
		`void main()`
		`{`
		`  int Eno=123, char EName[]="Rehan Swarup";`
		`  cout<<setw(5)<<Eno<<setw(25)<<EName<<endl;`
		`}`
			1

	Ans	(i) iostream.h (ii) iomanip.h OR iomanip.h - (As iostream.h is included in iomanip.h) *(½ Mark for writing each correct header file)* *OR* *(Full 1 Mark for mentioning only iomanip.h)* *Note: Ignore any other header files, if mentioned.*	

	(c)	Rewrite the following C++ program code after removing the syntax error(s) (if any). Underline each correction.
		`include<iostream.h>`
		`class TRAIN`
		`{`
		`  long TrainNo;`
		`  char Description [25];`
		`public`
		`  void Entry ()`
		`  {`
		`  cin>>TrainNo; gets(Description);`
		`  }`
		`  void Display()`
		`  {`
		`  cout<<TrainNo<<":"<<Description<<endl;`
		`  }`
		`};`
		`void main ()`
		`{`
		`  TRAIN T;`
		`  Entry. T(); Display. T();`
		`}`
			2

Ans

```
#include<iostream.h>
#include<stdio.h>
class TRAIN
{
        long TrainNo;
        char Description [25];
public :
        void Entry ()
        {
                cin>>TrainNo; gets(Description);
        }
       void Display()
       {
                cout<<TrainNo<<":"<<Description<<endl;
       }
};

void main ()
{
   TRAIN T;
  T.Entry(); T.Display();
}
```

(½ Mark for writing # before include<iostream.h>
(½ Mark for writing #include <stdio.h>
(½ Mark for writing : after public)
(½ Mark for writing T.Entry(); and T.Display(); correctly)

(d) Find the output of the following program : 3

```
#include<iostream.h>
struct POINT
{ int X,Y,Z;} ;

void StepIn(POINT & P, int Step = 1)
{
     P.X+=Step;
     P.Y-=Step;
     P.Z+=Step;
}

void StepOut(POINT & P, int Step = 1)
{
     P.X-=Step;
     P.Y+=Step;
     P.Z-=Step;
}
```

```
void main()
{
    POINT P1={15,25,5}, P2={10,30,20};
    StepIn(P1);
    StepOut(P2,4);
    cout<< P1.X<<","<<P1.Y<<","<<P1.Z<<endl;
    cout<< P2.X<<","<<P2.Y<<","<<P2.Z<<endl;
    StepIn(P2,12);
    cout<< P2.X<<","<<P2.Y<<","<<P2.Z<<endl;
}
```

Ans

```
16,24,6
6,34,16
18,22,28
```

(1 Mark for each line with correct values)
OR
(½ Mark for any two correct values in each line)
Note:
Deduct ½ Mark if any/all ',' missing
Deduct ½ Mark if endl is not considered at the right positions

(e) Find the output of the following program : 2

```
#include<iostream.h>
#include<ctype.h>
void ChangeIt(char Text[], char C)
{
  for (int K=0;Text[K]!='\0';K++)
  {
    if(Text [K]>='F' && Text [K]<='L')
      Text[K]=tolower (Text [K]);
    else
      if(Text [K]=='E' || Text [K]=='e')
        Text [K]=C;
      else
      if (K%2==0)
        Text [K]=toupper (Text [K]);
      else
        Text [K]=Text [K-1];
  }
}
void main ()
{
      char OldText[]="pOwERALone";
      ChangeIt(OldText, '%');
      cout<<"New TEXT:"<<OldText<<endl;
}
```

	Ans	**New TEXT : PPW%RR11N%**	
	Ans	*(½ Mark for writing PPW as the first three characters)* *(½ Mark for writing %RR as the next three characters)* *(½ Mark for writing 11 as the next two characters)* *(½ Mark for writing N% as the next two characters)* *Note: Deduct ½ Mark for not mentioning New TEXT :*	
	(f)	The following code is from a game, which generates a set of 4 random numbers. Pallav is playing this game, help him to identify the correct option(s) out of the four choices given below as the possible set of such numbers generated from the program code so that he winds the game. Justify your answer.	2

```
#include <iostream.h>
#include <stdlib.h>
const int LOW=15;
void main ( )
{
   randomize( ) ;
   int POINT=5,Number;
   for (int I=1;I<=4;I++)
   {
      Number=LOW+random(POINT);
      cout<<Numbe<<":";
      POINT- -;
   }
}
```

(i) 19:16:15:18:

(ii) 14:18:15:16:

(iii) 19:16:14:18:

(iv) 19:16:15:16:

Ans (iv) 19:16:15:16:

Justification is as follows:

I	POINT	Number	
		Minimum	Maximum
1	5	15	19
2	4	15	18
3	3	15	17
4	2	15	16

The only option that satisfies these values is option (iv).

(1 Mark for mentioning correct option)
(1 Mark for any valid justification)
Note: Only ½ Mark to be given if only options (i) & (iv) are mentioned as correct options; no other combination of options is acceptable;

2. (a) What do you understand by Polymorphism? Also, give an example in C++ to illustrate the same. 2

Ans **The process of using an operator or a function in different ways for different set of inputs given is known as polymorphism. Function overloading is an example of polymorphism, where the functions having same name with different set of parameters perform different operations.**

Example:

```
void Disp()              //Function 1
{
   cout<<"Hello"<<endl;
}
void Disp(int N)     //Function 2
{
   for(int I=1;I<=N;I++)
      cout<<I<<endl;
}
void Disp(int N,int M) //Function 3
{
   for(int I=N;I<=M;I++)
      cout<<N<<"x"<<I<<"="<<N*I<<endl;
}
void main()
{
   int x=5,y=10;
   Disp(x) ;    //Function 2 called- Prints numbers from 1 to 5
   Disp(x,y) ;  //Function 3 called- Prints from multiples of 5
                //ranging from 5 to 10
   Disp() ;     //Function 1 called- Prints Hello
}
```

(1 Mark for correct explanation of Polymorphism)
(1 Mark for a valid example of Polymorphism)

(b) Answer the questions (i) and (ii) after going through the following class: 2

```
class Test
{
   int Regno, Max, Min, Score;
public:
   TEST()                                    //Function 1
   {
      Regno=101;Max=100;Min=40;Score=75;
   }
   Test(int Pretgno, int Pscore)          //Function 2
   {
      Reno=Pregno;Max=100;Min=40;Score=Pscore;
   }
```

```
~ TEST()                                    //Function 3
{
    cout<<"TEST Over"<<endl;
}
void Display ()                             //Function 4
{
    cout<<Regno<<";"<<Max<<";"      <<Min<<endl;
    cout<<"[Score] "<<Score<<endl;
}
};
```

(i) As per object Oriented Programming, which concept is illustrated by **Function** 1 and **Function** 2 together?

Ans **Polymorphism**
OR
Function Overloading
OR
Constructor Overloading

(1 Mark for naming the concept correctly)

(ii) What is **Function 3** specifically referred as? When do you think, **Function 3** will be invoked/called?

Ans **Destructor, invoked or called when scope of an Object gets over.**

(1/2 Mark for naming Destructor correctly)
(1/2 Mark for mentioning correctly when it is invoked)

(c) Define a class ITEM in C++ with following description : 4

Private Members

- Code of type integer (Item Code)
- Iname of type string (Item Name)
- Price of type float (Price of each Item)
- Qty of type integer (quantity of item in stock)
- Offer of type float (Offer percentage on the item)
- A member function GetOffer () to calculate offer percentage as per the following rule:

If Qty<50	Offer is 0
If 50<>Qty<100	Offer is 5
If Qty>100	Offer is 10

Public Members

- A function GetStock( ) to allow user to enter values for Code, Iname, Price, Qty and call function GetOffer( ) to calculate the offer
- A function ShowItem() to allow user to view the content of all the data members

Ans

```
class ITEM
{
   int Code;
   char Iname[20];
   float Price;
   int Qty;
   float Offer;
   void GetOffer();
public:
   void GetStock()
   {
      cin>>Code;
      gets(Iname); //OR cin.getline(Iname,80);  OR cin>>Iname;
      cin>>Price>>Qty;
      GetOffer();
   }
   void ShowItem()
   {
      cout<<Code<<Iname<<Price<<Qty<<Offer;
   }
};
void ITEM::GetOffer()
{
   if(Qty<=50)
      Offer = 0;
   else if (Qty <=100)
      Offer = 5;   //OR Offer = 0.05;
   else
      Offer = 10;  //OR Offer = 0.1;
}
```

(½ Mark for correct syntax for class header)
(½ Mark for correct declaration of data members)
(1 Mark for correct definition of GetOffer())
(1 Mark for correct definition of GetStock () with proper invocation of GetOffer() function)
(1 Mark for correct definition of ShowItem())

NOTE:
Deduct ½ Mark if GetOffer() is not invoked properly inside GetStock() function

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

```
class Chairperson
{
   long CID;              //Chairperson Identification Number
   char CName[20];
protected:
   char Description[40]
   void Allocate() ;
```

```
public:
   Chairperson();
   void Assign ();
   void Show ();
};
```

```
class Director
{
   int DID;          //Director ID
   char Dname[20];
protected:
   char Profile[30];
public:
   Director();
   void Input();
   void output();
};
```

```
class Company: private Chairperson, public Director
{
   int CID;         //Company ID
   char City[20], Country[20];
public:
   Company();
   void Enter();
   void Display();
};
```

i) Which type of inheritance out of the following is specifically is illustrated in the above C++ code?
(a) Single Level Inheritance
(b) Multi Level Inheritance
(c) Multiple Inheritance

Ans **(c) Multiple Inheritance**

(1 Mark for writing correct inheritance type)

ii) Write the names of data members, which are accessible by objects of class type Company.

Ans **None**

(1 Mark for writing None or No data members)

iii) Write the names of all member functions, which are accessible by objects of class type Company.

	Ans	**Enter(), Display(), Input(), output()** ***(1 Mark for writing correct member functions)*** ***Note:*** • ***Both output() or Output() are acceptable as correct answer, since differentiation between small and capital O is very difficult.*** • ***No marks to be awarded for any other alternative answer*** • ***Ignore mention of Constructor(s)***	
	iv)	Write the names of all members, which are accessible from member functions of class Director.	
	Ans	**Input(), output(), Profile, Dname, DID** ***(1 Mark for writing correct members)*** ***Note:*** • ***Both output() or Output() are acceptable as correct answer since differentiation between small and capital O is very difficult.*** • ***No marks to be awarded for any other alternative answer*** • ***Ignore mention of Constructor(s)***	
3	(a)	Write a function CHANGE() in C++, which accepts an array of integer and its size as parameters and divide all those array elements by 7 which are divisible by 7 and multiply other array elements by 3.	3

Sample Input Data of the array

A[0]	A[1]	A[2]	A[3]	A[4]
21	12	35	42	18

Content of the array after calling CHANGE() function

A[0]	A[1]	A[2]	A[3]	A[4]
3	36	5	6	54

Ans

```
void CHANGE(int A[], int N)
{
   for(int I = 0; I<N; I++)
   {
      if (A[I]%7 == 0)
         A[I] = A[I] / 7;
      else
         A[I] = A[I] * 3;
   }
}
```

OR
Any other correct equivalent function definition

(½ Mark for correct Function Header)
(½ Mark for correct loop)
(½ Mark for correct checking of divisibility of array elements by 7)
(½ Mark for correct else OR correct checking of non divisibility of array elements by 7)
(½ Mark for each correct assignment)

(b) An array P[50] [60] is stored in the memory along the column with each of the element occupying 2 bytes, find out the memory location for the element P[10][20], if the Base Address of the array is 6800. 3

Ans
```
Loc(P[I][J])    = Base(P)+W(I+J*M)
Loc(P[10][20]) = Base(P)+ 2(10+20*50)
Loc(P[10][20]) = 6800 + 2(10+20*50)
                = 6800 + 2(10+1000)
                = 6800 + 2*1010
                = 6800 + 2020
                = 8820
```
OR
```
Address of P[i][j]=BaseAddress + W((i - L1) + (j - L2) * M)
Address of P[10][20]= 6800 + 2 ((10 - 0) + (20 - 0) x 50)
                = 6800 + 2 x 1010
                = 6800 + 2020
                = 8820
```
OR
```
Address of P[I][J] along the column
                =BaseAddress + W (( I - LBR)  + (J - LBC) * M)
(where N is the number of rows, LBR = LBC = 1)
Address of P[10][20]=6800 + 2((10 - 1) +(20 - 1)x 50)
                    = 6800 + 2 ( 9 + 19 x 50 )
                    = 6800 + 2 x 959
                    = 6800 + 1918
                    = 8718
```

(1 Mark for writing correct formula (for column major) OR substituting formula with correct values for calculating Address)
(2 marks for calculating correct address)

(c) Write a complete program in C++ to implement a dynamically allocated Stack containing names of Countries. 4

Ans
```
#include<iostream.h>
#include<stdio.h>
struct Node
{
   char Country[20];
   Node *Link;
};
```

```
class Stack
{
   Node *Top;
public:
   Stack() {Top = NULL;}
   void Push();
   void Pop();
   void Display();
   ~Stack();
};
void Stack::Push()
{
   Node *Temp = new Node;
   gets(Temp -> Country);
   Temp -> Link = Top;
   Top = Temp;
}
void Stack::Pop()
{
   if(Top !=NULL)
   {
      Node *Temp = Top;
      Top = Top -> Link;
      delete Temp;
   }
   else
      cout<<"Stack Empty";
}
void Stack::Display()
{
   Node *Temp = Top;
   while(Temp!=NULL)
   {
      cout<<Temp -> Country <<endl;
      Temp = Temp -> Link;
   }
}
Stack::~Stack()
{
   while (Top!=NULL)
   {
      NODE *Temp=Top;
      Top=Top->Link;
      delete Temp;
   }
}
```

```
void main()
{
   Stack ST; char Ch;
   do
   {
      cout<<"P/O/D/Q";
      cin>>Ch;
      switch (Ch)
      {
         case 'P':ST.Push();break;
         case 'O':ST.Pop();break;
         case 'D':ST.Disp();
      }
   } while (Ch!='Q');
}
```

(d) Write a function int SKIPSUM(INT A[][3], int N, int M) in C++ to find and return the sum of elements from all alternate elements of a two dimensional array starting from A[0][0]. 2

Hint:
If the following is the content of the array

A[0][0]	A[0][1]	A[0][2]
4	5	1
A[1][0]	A[1][1]	A[1][2]
2	8	7
A[2][0]	A[2][1]	A[2][2]
9	6	3

The function SKIPSUM() should add elements A[0][0],A[0][2],A[1][1],A[2][0] and A[2][2].

Ans

```
int SKIPSUM(int A[][3], int N, int M)
{
   int S=0;
   for(int I = 0; I< N; I++)
      for (int J = (I%2)?1:0; J<M; J = J+2)
         S = S + A[I][J];
   return S;
}
```

OR

```
int SKIPSUM(int A[][3], int N, int M)
{
   int S=0;
   for(int I = 0; I< N; I++)
      for (int J = (I%2==0)?0:1 ; J<M; J = J+2)
         S = S + A[I][J];
   return S;
}
```

OR

```
int SKIPSUM(int A[][3], int N, int M)
{
   int I,J, S=0;
   for(I = 0; I< N; I++)
   {
      if (I%2)                          //OR (I%2 !=0 ) OR (I%2 == 1)
         J=1;
      else
         J=0;
      for ( ; J<M; J = J+2)
         S = S + A[I][J];
   }
   return S;
}
```

OR

```
int SKIPSUM(int A[][3], int N, int M)
{
   int S=0, C=0;
   for(int I = 0; I< N; I++)
      for (int J = 0; J<M; J++ )
      {
         if (C%2 == 0)
            S = S + A[I][J];
         C++;
      }
   return S;
}
```

OR

```
int SKIPSUM(int A[][3], int N, int M)
{
   int S=0, C=1;
   for(int I = 0; I< N; I++)
      for (int J = 0; J<M; J++ )
      {
         if (C%2 != 0)
            S = S + A[I][J];
         C++;
      }
   return S;
}
```

OR

```
int SKIPSUM(int A[][3], int N, int M)
{
   int S=0;
   for(int I = 0; I< N; I++)
      for (int J = 0; J<M; J++ )
      {
         if ((I+J)%2 == 0)
            S = S + A[I][J];
      }
   return S;
}
```

OR

Any other correct equivalent function definition

(½ Mark for correct function header)
(½ Mark for each correct loop)
(½ Mark for checking alternate cells)
(½ Mark for finding Sum of elements)
(½ Mark for returning the Sum)

(e) Evaluate the following postfix notation of expression: (Show status of Stack after each operation) — 2

False, True, NOT, OR, True, False, AND, OR

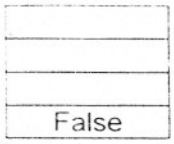
Ans

Element Scanned	Stack
False	False
True	False, True
NOT	False, False
OR	False
True	False, True
False	False, True, False
AND	False, False
OR	False

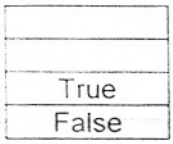
RESULT = False

OR

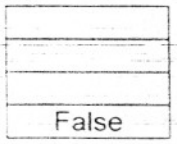
Step 1: Push



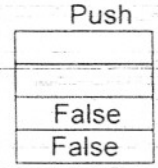
Step 2: Push



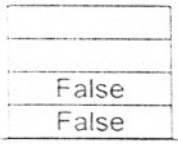
Step 3: NOT

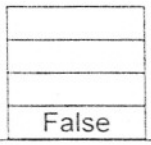


Push

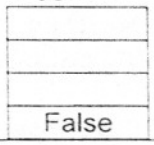


Step 4: OR

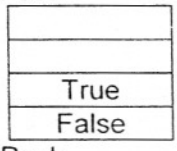




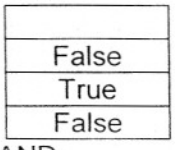
Push



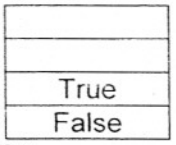
Step 5: Push

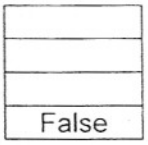


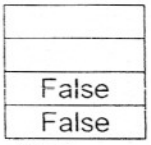
Step 6: Push



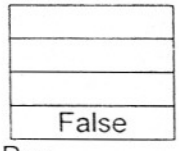
Step 7: AND

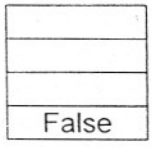




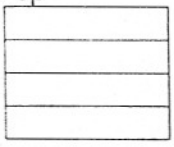


Step 8: OR





Step 9: Pop



OR

Any other method for evaluating the given postfix expression showing the Stack Status.

(½ Mark for correctly evaluating expression up to each operator
(1 Mark only to be given for writing correct answer without showing the Stack Status)

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

```
#include <fstream.h>
class Client
{
   long Cno; char Name [20], Email [30] ;
public:
  //Function to allow user to enter the Cno, Name, Email
  void Enter() ;
  //Function to allow user to enter (modify) Email
  void Modify() ;
  long ReturnCno() {return Cno;}
};
void ChangeEmail()
{  Client C;
   fstream F;
```

```
   F.open ("INFO.DAT", ios::binary|ios::in|ios::out);
   long Cnoc; // Client's no. whose Email needs to be changed
   cin>>Cnoc;
   while (F.read((char*)&C, sizeof(C)))
   {
      if (Cnoc == C.ReturnCno())
      {
        C.Modify();
                                  //Statement 1
        int Pos = _____           //To find the current position of file
                                  //pointer

                                 //Statement 2
        _________                 //to move the file pointer to write the
                                  //modified record back onto the file
                                 // for the desired Cnoc

         F.write((char*)&C, sizeof(C));
      }
   }
F.close();
}
```

Ans

Statement 1:

```
F.tellg();
```

Statement 2:

```
F.seekp(Pos-sizeof(C));
```

OR

```
F.seekp(-sizeof(C), ios::cur);
```

OR

Any equivalent correct method

(½ Mark for each correct Statement)

(b) Write a function in C++ to count the words "this" and "these" present in a text file "ARTICLE.TXT". 2

[Note that the words "this" and "these " are complete words]

Ans

```
void COUNT()
{
      ifstream Fil;
      Fil.open("ARTICLE.TXT");
      char Word[80];
      int C1 = 0, C2 = 0;
      while(!Fil.eof())
      {
            Fil>>Word;
```

OR `ifstream Fil("ARTICLE.TXT");`

```
            if(strcmp(Word, "this")==0)
                  C1++;
            else if(strcmp(Word, "these")==0)
                  C2++;
      }
      cout<<"Count of -this- in file:"<<C1;
      cout<<"Count of -these- in file:"<<C2;
```

OR `cout<<"Count of -this- and -these- in file:"<<C1+C2;`

```
      Fil.close(); //Ignore
}
```

OR

```
void COUNT()
{
      ifstream Fil("ARTICLE.TXT");
      char Word[80];
      int C = 0;
      while(!Fil.eof())
      {     Fil>>Word;
            if(strcmp(Word, "this")==0||strcmp(Word, "these")==0)
                  C++;
      }
      cout<<"Count of -this- and -these- in file:"<<C;
      Fil.close(); //Ignore
}
```

OR

```
ifstream Fil;
Fil.open("ARTICLE.TXT");
```

OR

```
void COUNT()
{
   ifstream Fil("ARTICLE.TXT");
   //OR fstream Fil;
   //    Fil.open("ARTICLE.TXT",ios::in);
   char STR[10];
   int C1=0, C2=0;
   while(Fil.getline(STR,10, ' '))
   {
      if(strcmp(STR, "this")==0)
            C1++;
      else if(strcmp(STR, "these")==0)
            C2++;
      }
   }
   cout<<"Count of -this- in file:"<<C1;
   cout<<"Count of -these- in file:"<<C2;
   Fil.close();//Ignore
}
```

OR `cout<<"Count of -this- and -these- in file:"<<C1+C2;`

OR

```
void COUNT()
{
      ifstream Fil;
      Fil.open("ARTICLE.TXT");
      char Word[80],Ch;
      int C1 =0, C2 = 0, I=0;
      while(Fil.get(Ch))
      {
           if(Ch!= ' ')
              Word[I++] = Ch;
           else
           {
              Word[I] = '\0';
              if(strcmp(Word, "this")==0)
                 C1++;
              else if(strcmp(Word, "these")==0)
                 C2++;
              I=0;
           }
      }
      cout<<"Count of -this- in file:"<<C1;
      cout<<"Count of -these- in file:"<<C2;
```

OR `ifstream Fil("ARTICLE.TXT");`

OR

```
cout<<"Count of -this- and -these- in file:"<<C1+C2;
```

```
      Fil.close(); //Ignore
}
```

OR

Any other correct function definition

(½ Mark for opening ARTICLE.TXT correctly)
(½ Mark for reading each word (Whichever method adopted) from the file)
(½ Mark for comparing the word with 'this' and 'these' and incrementing counter(s))
(½ Mark for displaying the individual count of 'this' and 'these' or the total count of 'this' and 'these' with/without the Text Message)

(c) Write a function in C++ to search and display details of all flights, whose destination is "Mumbai" from a binary file "FLIGHT.DAT". Assuming the binary file is containing the objects of the following class. 3

```
class FLIGHT
{
        int Fno;          //Flight Number
        char From[20] ;   //Flight Starting Point
        char To[20] ;    / /Flight Destination
```

```
public:
        char* GetFrom() {return From;}
        char* GetTo() {return To;}
        void Enter() {cin>>Fno;gets(From);gets(To);}
        void Display() {cout<<Fno<<":"<<From<<":"<<To<<endl;}
};
```

Ans

```
void Read()
{
   FLIGHT F;
   ifstream fin;
   fin.open("FLIGHT.DAT", ios::binary);
```

OR `ifstream fin("FLIGHT.DAT", ios::binary);`

```
   while(fin.read((char*)&F, sizeof(F)))
   {
      if(strcmp(F.GetTo(),"Mumbai"))
         F.Display();
   }
   fin.close(); //Ignore
}
```

OR

```
void Read()
{
   FLIGHT F;
   ifstream fin;
   fin.open("FLIGHT.DAT", ios::binary);
```

OR `ifstream fin("FLIGHT.DAT", ios::binary);`

```
   if (fin)
   {
   fin.read((char*)&F, sizeof(F));
   while(!fin.eof())
   {
      if(strcmp(F.GetTo(),"Mumbai"))
         F.Display();
      fin.read((char*)&F, sizeof(F))
   }
   fin.close(); //Ignore
}
```

OR

Any other correct function definition

(½ Mark for opening FLIGHT .DAT correctly)
(½ Mark for reading each record from FLIGHT.DAT)
(½ Mark for correct loop / checking end of file)
(1 Mark for comparing value returned by GetTo() with "Mumbai")
(½ Mark for displaying the matching record)

5 (a) What do you understand by Candidate Keys in a table? Give a suitable example of Candidate Keys from a table containing some meaningful data. **2**

Ans **A table may have more than one such attribute/group of attribute that identifies a tuple uniquely, all such attribute(s) are known as Candidate Keys.**

Table:Item

Ino	Item	Qty
I01	Pen	560
I02	Pencil	780
I04	CD	450
I09	Floppy	700
I05	Eraser	300
I03	Duster	200

Candidate Keys

(1 Mark for writing correct definition of Candidate Key)
(1 Mark for giving suitable example)

(b) Consider the following tables STORE and SUPPLIERS and answer (b1) and (b2) parts of the question:

Table: STORE

ItemNo	Item	Scode	Qty	Rate	LastBuy
2005	Sharpener Classic	23	60	8	31-Jan -09
2003	Ball Pen 0.25	22	50	25	01-Feb-10
2002	Get Pen Premium	21	150	12	24-Feb-10
2006	Get Pen Classic	21	250	20	11-Mar-09
2001	Eraser Small	22	220	6	19-Jan-09
2004	Eraser Big	22	110	8	02-Dec-09
2009	Ball Pen 0.5	21	180	18	03-Nov-09

Table: SUPPLIERS

Scode	Sname
21	Premium Stationers
23	Soft Plastics
22	Tetra Supply

(b1) Write SQL commands for the following statements :

(i) To display details of all the items in the Store table in ascending order of LastBuy

Ans

```
SELECT * FROM STORE ORDER BY LastBuy;
```

(1 Mark for correct query)
(½ Mark for partially correct answer)

(ii) To display ItemNo and Item name of those items from Store table whose Rate is more than 15 Rupees.

		Ans	`SELECT ItemNo, Item FROM STORE WHERE Rate >15;` *(1 Mark for correct query)* *(½ Mark for partially correct answer)*	
		(iii)	To display the details of those items whose Supplier code (Scode) is 22 or Quantity in Store(QTY) is more than 110 from the table Store.	
		Ans	`SELECT * FROM STORE WHERE Scode = 22 OR Qty >110;` *(1 Mark for correct query)* *(½ Mark for partially correct answer)*	
		(iv)	To display Minimum Rate of items for each Supplier individually as per Scode from the table Store.	
		Ans	`SELECT Scode, MIN(Rate) FROM STORE GROUP BY Scode;` *(1 Mark for correct query)* *(½ Mark for partially correct answer)*	
	(b2)		Give the output of the following SQL queries :	2
			Note: In all output questions ignore Column Headings	
		(i)	SELECT COUNT(DISTINCT Scode) FROM Store ;	

		Ans	`COUNT(DISTINCT Scode)`
			`3`
			(½ Mark for correct Output)	

		(ii)	SELECT Rate*Qty FROM Store WHERE ItemNo=2004;	

		Ans	`RATE*QTY`
			`880`
			(½ Mark for correct Output)	

		(iii)	SELECT Item, Sname FROM Store S, Suppliers P WHERE S.Scode=P.Scode AND ItemNo=2006;	

		Ans	`ITEM SNAME`
			`Gel Pen Classic Premium Stationers`
			(½ Mark for correct Output)	

		(iv)	SELECT MAX(LastBuy) FROM Store;	

		Ans	`MAX(LASTBUY)`
			`24-Feb-10`
			(½ Mark for correct Output)	

6	(a)	Verify the following algebraically. (A'+B'). (A+B) =A'.B+A.B'		2

Ans

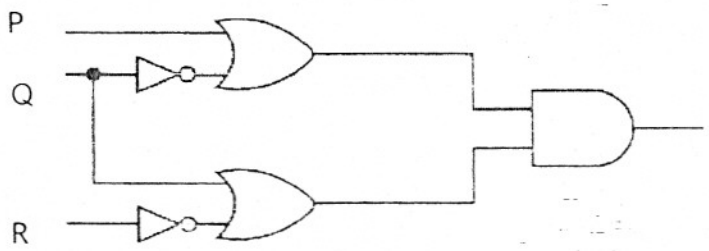
```
LHS
   (A'+B') . (A+B)
=  A'.A + A'.B + A.B' + B'.B
=  0 + A'.B + A. B' + 0
=  A'.B + A.B'
=  RHS            (Verified)
```

OR

Any other valid algebraic verification

(2 Marks for verifying LHS = RHS OR RHS = LHS)

(b) Write the equivalent Boolean Expression for the following Logic Circuit: 2



Ans `(P + Q') . (Q + R')`

(2 Marks for the final expression `(P + Q') . (Q + R')` *)*
OR
(1 Mark for any of the correct terms out of `(P + Q')` *or* `(Q + R')` *)*

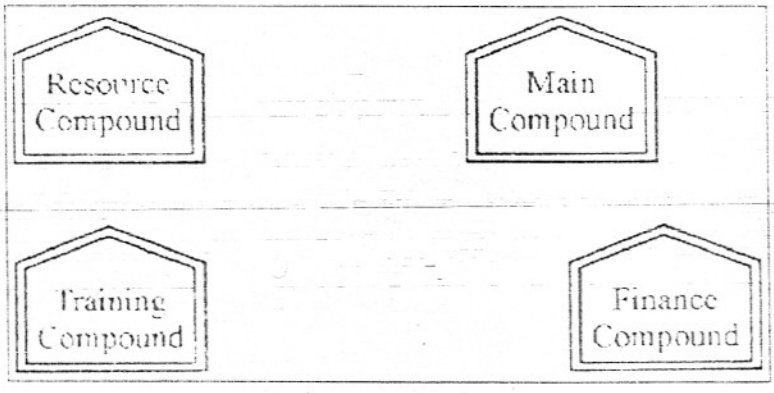
(c) Write the POS form of a Boolean function H, which is represented in a truth table as follows: 1

X	Y	Z	H
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

Ans `(X + Y + Z') . (X' + Y + Z') . (X' + Y' + Z)`

OR

`H(X,Y,Z) = Π (1, 5, 6)`

(b)	Which of the following is not an unit for data transfer rate? (i) bps (ii) abps (iii) gbps (iv) kbps	1
Ans	(ii) abps *(1 Mark for writing correct option)*	
(c)	What is the difference between Trojan Horse and Virus in terms of computers?	1
Ans	**TROJAN HORSE: "Malware" computer programs presented as useful or harmless in order to induce the user to install and run them.** **VIRUS: Virus is a malicious program that damages data and files and causes harm to computer system.** *(1 Mark for mentioning any one valid difference)* *OR* *(½ Mark for correct definition of each term)*	
(d)	What term we use for a software/hardware device, which is used to block, unauthorized access while permitting authorized communications. This term is also used for a device or set of devices configured to permit, deny, encrypt, decrypt, or proxy all (in and out) computer traffic between different security domains based upon a set of rules and other criteria.	1
Ans	Firewall *(1 Mark for writing correct term)*	
(e)	"Learn Together" is an educational NGO. It is setting up its new campus at Jabalpur for its webbased activities. The campus has 4 compounds as shown in the diagram below :  Centre to center distances between various Compounds as per architectural drawings(in Metre) is as follows :	4

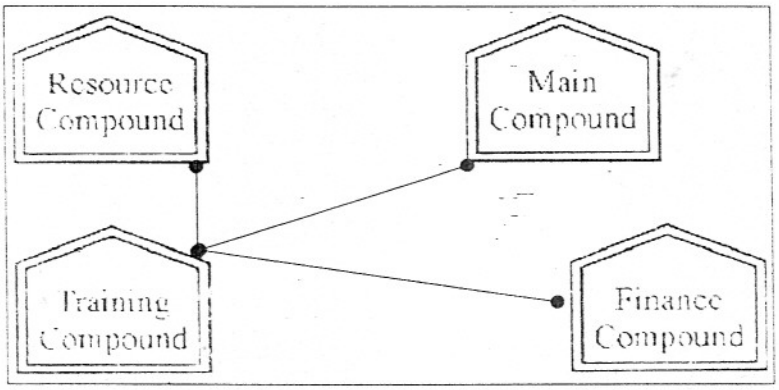
Main Compound to Resource Compound	110 m
Main Compound to Training Compound	115 m
Main Compound to Finance Compound	35 m
Resource Compound to Training Compound	25 m
Resource Compounds to Finance Compound	135 m
Training Compounds to Finance Compound	100 m

Expected Number of Computers in each Compound is as follows :

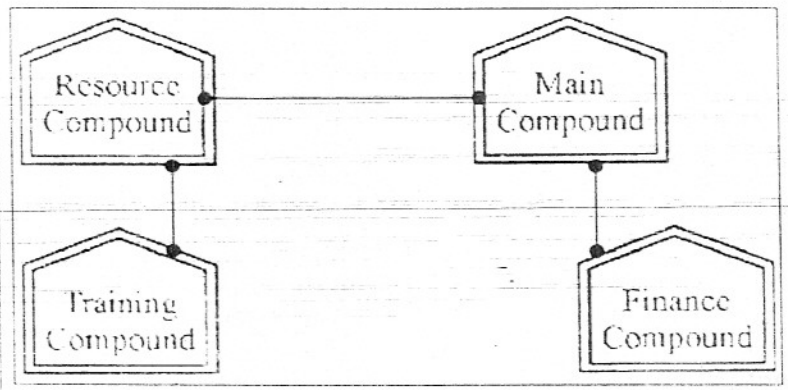
Main Compound	5
Resource Compound	15
Training Compound	150
Accounts Compound	20

(e1) Suggest a cable layout of connections between the compounds. 1

Ans



OR



(1 Mark for mentioning any valid connectivity or topology or diagram connecting various compounds inside the campus)

		(e2)	Suggest the most suitable place (i.e. compound) to house the server of for this NGO. Also, provide a suitable reason for your suggestion.	1
		Ans	**Training Compound as it contains maximum number of computers.** ***(½ Mark for mentioning the correct compound)*** ***(½ Mark for correct justification)*** *OR* ***(1 Mark for any other location with a valid justification)***	
		(e3)	Suggest the placement of the following devices with justification : (i) Repeater (ii) Hub/Switch	1
		Ans	**(i) A Repeater should be placed when the distance between any two connecting compounds exceeds 70 m.** **(ii) Every compound will need one Hub / Switch, to send signals to all of the workstations connected to it** OR **Any diagrammatic representation with valid justification** ***(½ Mark for each correct placement of Devices with valid justifications)***	
		(e4)	The NGO is planning to connect its International office situated in Mumbai, which out of the following wired communication link, you will suggest for a very high speed connectivity? (i) Telephone Analog Line (ii) Optical Fiber (iii) Ethernet Cable	1
		Ans	(ii) **Optical Fiber** ***(1 Mark for correct option /answer)***	
	(f)		Write the full forms of the following : (f1) GNU (f2) XML	1
		Ans	**(f1) GNU's not Unix** **(f2) eXtensible Markup Language** ***(½ Mark for each full form)***	
	(g)		Write one advantage of each for Open Source Software and Proprietary software.	1
		Ans	**An Open Source Software is freely and liberally licensed because of which users have right to study, change, and improve its design and source code.** **A Proprietary Software has a copyright owner, who can restrict the user's control over the software, its modification, or restrictions in publishing of modified or unmodified versions.** ***(½ Mark for writing correct advantage / definition for Open Source Software)*** ***(½ Mark for writing correct advantage / definition for Proprietary Software)***	