Roll Number		

SET A

INDIAN SCHOOL MUSCAT
FIRST PRELIMINARY EXAMINATION
COMPUTER SCIENCE

CLASS: XII | Sub. Code: 083 | Time Allotted: 3 Hrs

17.01.2019 | Max. Marks: 70

General Instructions:

(a) All questions are compulsory.

(b) Programming language is C++

(c) In Question 2(b, d), 3 and 4 have internal choices.

1(a) Which C++ header file(s) are essentially required to be included to run/execute the following C++ code: **1**

```
void main()
{
  char str[10];
  i=strlen(str);
  gets(str);
  puts(str);
}
```

(b) Write the type of C++ Operators from the following: **2**

X= (9>34&&5>15)?20:10;

(c) Rewrite the following C++ code after removing any/all Syntactical Error(s) with each correction underlined. **2**

```
#include “iostream.h”
class MEMBER
{
   int Mno;
   float Fees;
    public:
        void MEMBER()
          { Mno=0;}
            void Register ( )
            {cin>>Mno>>Fees;}
            void Display( )
            {cout<<Mno<<" : "<<Fees<<endl;}
            };
void main( )
```

```
{
        MEMBER switch;
        Register();
        Switch.Display();
 }
```

(d) Find and write the output of the following C++ program code assuming all the required header files are included. **2**

```
void main()
{
int Nums[] = {23,34,45,17};
int *Ptr = Nums, I,J;
for(I = 1; I<=3; I++)
{
*Ptr += *Ptr%3;
 Ptr++;
}
for(J=1; J<=I; J++)
{
cout<<Nums[J-1];
cout<<endl;
}
}
```

(e) Find and write the output of the following C++ program code assuming all the required header files are included. **3**

```
void Xchange(int &X, int Y)
{  Y ++;
X += 3*Y;
}
int main()
{
  int A[2][3] = { {10,12,14}, {18,20,22} },I;
for( I=0;I<2; I++)
Xchange(A[I][1],A[I][0]);
for(I=0;I<2; I++)
{
for(int J=0;J<3; J++)
cout<<A[I][J]<<"#";
cout<<endl;
}
}
```

(f) Observe the following program and find out, which output(s) out of (i) to (iv) will be expected from the program? What will be the minimum and the maximum value assigned to the variable x? **2**

Assume all the required header files are included.

```
void main( )
{    randomize( );
  int p=33,q=333;
  int x=random(3)+4;
  int y=random(2)+2;
  for(int i=0;i<x;i++)
  cout<<'#';
  cout<<p<<'&';
  for(i=0;i<y;i++)
  cout<<'@';
  cout<<q<<endl;
 }
```

i. ##33&@333 ii. ##33&@@333

iii. ######33&@@333 iv. ####33&@@@

2(a) What do you understand by Function overloading? Explain with suitable example. **2**

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

```
class Inter
        { int m;
          public:
               Inter( int y) { m = y; }// Function 1
               Inter ( Inter & t );// Function 2
               ~Inter( ) { }// Function 3
             };
```

(i) a) Create an object, such that it invokes Function 1.

b) What is Function 3?

(ii) Write complete definition for Function 2.

OR

What is a copy constructor? When does it get executed? Give a suitable example in C++ to illustrate your answer.

(c) Define a class Sports in C++ with following descriptions: **4**

Private members:

- S_Code of type long
- S_Name of type character array (String)
- Fees of type integer
- Duration of type integer

Public members:

- Constructor to assign initial values of S_Code as 1001, S_Name as "Cricket", Fees as 500, Duration 70.
- A function NewSports() which allows user to enter S_Code, S_Name and Duration. Also

assign the values to Fees as per the following conditions:

S_Name	Fees
Table Tennis	2000
Swimming	4000
Football	3000

- A function DisplaySports() to display all the details.

(d) Given the following class definition answer the questions (i) to (iv) that is follow: **4**

```
class University
{  char name [20];
protected :
char vc[20];
public :
int x;
void estd();
void inputdata();
void outputdata();
};
class College : protected University
{ int regno;
protected
char principal();
public :
int no_of_students;
void readdata();
void dispdata ( );
};
class Department : public College
{char name[20];
char  dname[20];
char HOD[20];
public :
void fetchdata(int);
void displaydata( ); };
```

(i) Name the base class and derived class of College.

(ii) Name the data member(s) that can be accessed from function displaydata().

(iii) What type of inheritance is depicted in the above class definition?

(iv) What will be the size of an object (in bytes) of class Department?

OR

Consider the following class music :

```
class music
{  int name[20];
protected :
int mno;
public :
music( )
{ strcpy(name,"NA");
  mno=0;}
void Minput( ) { mno++;};
int getmno()
{ return mno; } };
```

Write a code in C++ to privately derive another class 'Instrument' with the following additional members..

Data Members :

Iname string

Iduration float

Total long int

Public Member functions :

INPUT( ) : To enter Iname, Iduration and total.

OUTPUT( ) : To display the data members on the screen.

3(a) Write a user defined function in C++ to find the sum of both left and right diagonal elements from a two-dimensional array. **2**

OR

Write a user defined function SWAP which accepts a two dimension array in C++ to swap the first row elements with last row elements of a two dimensional array A[4][4].

(b) Write function definition for **SUMofFIVES(int A[], int N)** in C++ which finds and displays the sum of all multiples of 5 present in the array A passed as a parameter of the function, where N is the number of elements in the array. **3**

OR

Write the definition of a function Change(int P[ ], int N) in C++, which should change all the multiples of 10 in the array to 10 and rest of the elements as 1. For example, if an array of 10 integers is as follows :

P[0]	P[1]	P[2]	P[3]	P[4]	P[5]	P[6]	P[7]	P[8]	P[9]
100	43	20	56	32	91	80	40	45	21

After executing the function, the array content should be changed as follows :

P[0]	P[1]	P[2]	P[3]	P[4]	P[5]	P[6]	P[7]	P[8]	P[9]
10	1	10	1	1	1	10	10	1	1

(c) An integer array A [20][30] is stored along the row in the memory. If the element A[10][15] is stored at 5000, find out address of the location of A[5][12]. **3**

OR

An array A[-5…24][-6…13] is stored in the memory along the column with each of the element occupying 2 bytes, find the address of element A[15][5], if an element A[5][5] is stored at the memory location 2000.

(d) Write a member functions to perform delete operation in a dynamically allocated queue containing the objects of the following structure: **4**

```
struct  Game
{ char Gamename[30];
  int numofplayer;
 Game *next;
};
```

OR

Write function definition for Insert() in C++ to insert an element from a dynamically allocated Queue containing real numbers.

(e) Convert the following infix expression to its equivalent postfix expression Showing stack contents for the conversion: **2**

(A+B)*(C^(D-E)+F)-G

OR

Evaluate the following postfix expression show the status after execution of each operation:

2,13,+,5,-,6,3,/,5,*,+

4(a) Write function definition for EndT( ) in C++ to display those words of a text file "WORDS.TXT" which end with the alphabet **'t'**. **2**

OR

Write a function in C++ to count and display the number of lines not starting with Alphabet '**A**' present in a text file "STORY.TXT".

(b) Write a definition for function COSTLY( ) in C++ to read each record of a binary file GIFTS.DAT, find and display those items, which are priced more than 2000. Assume that the file GIFTS.DAT is created with the help of objects of class GIFTS, which is defined below : **3**

```
class GIFTS { int CODE;
              char ITEM[20];
              float PRICE;
              public:
              void Procure()
              {cin>>CODE;
               gets (ITEM);
               cin>>PRICE;     }
                void View()
               {  cout<<CODE<<":"<<ITEM<<":"<<PRICE<<endl;     }
              float GetPrice()
             {return PRICE;}
             };
```

OR

Write a definition for function reduce( ) in C++ to read each record of a binary file price.dat, find and delete those items, which are priced less than 2000. Assume that the file price.dat is created with the help of objects of class gift, which is defined below :

```
class gift  { int CODE;
              char ITEM[20];
              float PRICE;
              public:
              void Procure()
               {cin>>CODE;
                gets (ITEM);
                cin>>PRICE;     }
                void View()
                {  cout<<CODE<<":"<<ITEM<<":"<<PRICE<<endl;     }
                float GetPrice()
                {return PRICE;}
        };
```

(c) Given the following code in C++ answer questions (i) and (ii) that follow: **1**

```
#include <fstream.h>
class Seat
```

```
{int SNo; //Seat Number
int Status; //Seat Status
public:
Seat(){Status = 0; }
void Enter() { cin >> Sno; }
void Show(); //Function to display Seat Details
void SetStat(int N) //Function to Set Status of a seat
{Status = N;  }
int RStat(){return Status;}
int RSNo() { return SNo; }
};
void Book(long N) //N stands for Seat Number to Book
{  fstream File;
File.open("SEAT.DAT",ios::binary|ios::in|ios::out);
int Found=0;
Seat S;
while (!Found && File.read((char*)&S,sizeof(S)))
{
 if (S.RSNo()== N)
{
 Found = 1;
if(S.RStat() == 1)
cout<<"Seat Already reserved"<<endl;
else
{  S.SetStat(1);
_____ //Statement 1
_____ //Statement 2
}  }  }
if (!Found)
cout<<"Seat does not exist…"<<endl;
File.close();
}
```

(i) Write Statement 1 to place the file pointer at proper place for update.

(ii) Write Statement 2 to store the updated Seat Details for the booked ticket into the file SEAT.DAT.

OR

What is stream? Which file stream is required for seekg() ?

5(a) What do you understand by Projection operation in Relational Algebra? Give a suitable example to illustrate the same. **2**

(b) Consider the following tables MEMBER and CLUB. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii) **4+2**

Table: MEMBER

MID	MNAME	MTYPE	JOINDATE
1001	R SHARMA	LIFE	15-MAR-1993
1002	M R TIWARY	ANNUAL	2-JUN-1997
1003	M K KHAN	LIFE	25-SEP-1980
1004	A K SINGH	MONTHLY	1-JAN-2005
1005	S SEN	MONTHLY	31-DEC-2004
1006	R DUBEY	LIFE	16-SEP-2009
1007	M AGARWAL	ANNUAL	12-AUG-2009
1008	S DAS	ANNUAL	14-DEC-2006
1009	R K PATIL	MONTHLY	5-APR-2007
1010	N KRISHNA	ANNUAL	17-NOV-2009

Table: CLUB

MTYPE	FEES
MONTHLY	3000
ANNUAL	30000
LIFE	100000

(i) To display MID and MNAME of all LIFE Members from table MEMBER.

(ii) To display the details of all the Members in ascending order of NAME within MTYPE from table MEMBER.

(iii) To display the total number of Members for each MTYPE from table MEMBER.

(iv) To display the MNAME and the respective quarterly fees (FEES * 3) for all members whose MTYPE is MONTHLY from the tables MEMBER and CLUB.

(v) SELECT MNAME, JOINDATE FROM MEMBER WHERE JOINDATE BETWEEN '1-JAN-2005' AND '31-DEC-2006';

(vi) SELECT COUNT (DISTINCT MTYPE) FROM MEMBER;

(vii) SELECT MNAME, MTYPE FROM MEMBER WHERE MTYPE IN ('ANNUAL', 'LIFE');

viii) SELECT COUNT(*)FROM MEMBER WHERE JOINDATE<'1-JAN-2005';

6(a) State and verify De Morgan's Law using truth table. **2**

(b) Draw the Logic Circuit for the following Boolean Expression: **2**
X.Y' + X'.Z + Y. Z'

(c) Derive a Canonical SOP expression for a Boolean function F, represented by the following truth table: **1**

A	B	C	F(A,B,C)
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1

(d) Reduce the following Boolean Expression to its simplest form using K-Map: **3**
F(A,B,C,D)=Σ(0,1,2,3,6,7,8,9,10,11,13,14,15)

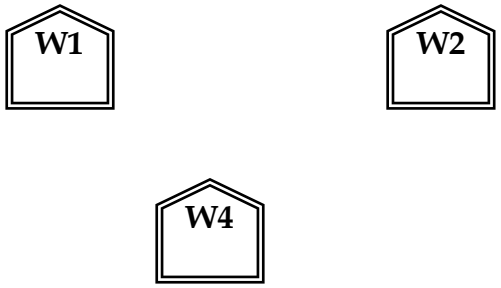
7(a) Write names of any two wireless transmission media with their respective fields of applications. **1**

(b) Write one advantage and one disadvantage of using Optical Fiber Cable over Co-Axial Cable for Networking? **1**

(c) Expand the following abbreviations: **2**
(i) GPRS (ii) GSM (iii) WLL (iv) PPP

(d) What kind of data gets stored in cookies and how is it useful? **2**

(e) A company in Reliance has 4 wings of buildings as shown in the diagram: **4**



Center to center distances between various Buildings:

W3 to W1	**50m**
W1 to W2	**60m**
W2 to W4	**25m**
W4 to W3	**170m**
W3 to W2	**125m**
W1 to w4	**90m**

Number of computers in each of the wing:

W1	**150**
W2	**15**

W3	**15**
W4	**25**

i) Suggest the cable layouts & topology of the connection between the wings.

ii) Suggest the wing to house the server with justification.

iii) Suggest the placement of the following devices with justification if the company wants minimized network traffic: 1)Repeater 2) Hub/Switch

iv) The company is planning to link its head office situated in India with the office in a hilly area where cable connection is not feasible. Suggest an economic way to connect them. Justify your answer.

End of the Question Paper