Roll Number		

SET B

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 files will be required to be included to execute the following code: **1**

```
void main( )
{
  int a,x;
char ch;
cin>>a>>x;
cin>>ch;
if (islower(ch))
cout<<x;
else
cout<<a;
}
```

(b) Write any two differences between global and local variables in terms of their lifetime and scope. **2**

(c) Rewrite the following program after removing the syntactical error(s), if any. Underline each correction. **2**

```
#include< iostream.h>
class game
{
  int gameid;
char gcode;
game(int x)
{
cout<<"constructor";
x=gameid;
 }
public:
void begin()
```

```
{
cin>>gameid;
gets(gcode);
    }
void game::show()
{
cout<<gameid<<":"<<gcode;}
};
void main( )
{ game obj;
  obj.begin();
 game.show();
}
```

(d) Give the output of the following program segment (Assume all required header files are included in the program) **3**

```
#include<iostream.h>
int x=50;
void sum(int j,int k)
{
 auto int x=8;
static int y=15;
int i=j;
x=x+i;
y=y+x;
k=k+y;
cout<<x<<":"<<y<<":"<<k<<endl;
}
void main()
{  for (int i=1;i<3;i++)
sum(i,x);
 }
```

(e) Look at the following C++ code and find the possible output(s) from the options (i) to (iv). Also write the maximum and minimum value that can be assigned to the variable score. **2**

```
#include<iostream.h>
#include<stdlib.h>
void main( )
{
randomize( );
int score,H=5;
score=random(H)+30;
for(int i=35;i>score;i--)
cout<<i<<'$';
```

}

(i) 35$34$33$32$31$30$

(ii) 35$34$33$32$31$

(iii) 30$31$32$33$34$35$36$

(iv) 35$34$33$32$31$30$

(f) Find the output of the following assume all the required header files are included. **2**

```
void main ( )
{   char *String= "Needle&Thread" ;
int *Ptr, A [ ] = { 1,5,7,9,2,4,6,8,10,12,16,18};
Ptr = A;
for(int i=0;i<3;++i)
{    cout << * Ptr << String<< endl ;
String+=5;
Ptr+=3;      }
}
```

2(a) Explain concept of data hiding with an example. **2**

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

```
class Annual
        { int m;
          public:
               Annual( int y) { m = y; }// Function 1
               Annual ( Annual & A);// Function 2
               ~Annual( ) { }// 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 parameterized constructor? When does it get executed? Give a suitable example in C++ to illustrate your answer.

(c) Define a class Departmental with the following specifications: **4**

Private data members

Prod_name string (45 charactes) [Product name]

Listprice long

Dis_Price long [Discount Price]

Net long [Net Price]

Dis_type char(F or N) [Discount type]

Cal_price() – The store gives a 10% discount on every product it sells. However at the time of

festival season the store gives 7% festival discount after 10% regular discount. The discount type can be checked by tracking the discount type. Where 'F' means festival and 'N' means Non-festival. The Cal_price() will calculate the Discount Price and Net Price on the basis of the following table.

Product Name	List Price(Rs.)
Washing Machine	12000
Colour Television	17000
Refrigerator	18000
OTG	8000
CD Player	4500

Public members

- Constructor to initialize the string elements with "NULL", numeric elements with 0 and character elements with 'N'
- Accept() - Ask the store manager to enter Product name, list Price and discount type . The function will invoke Cal_price() to calculate Discount Price and Net Price .
- ShowBill() - To generate the bill to the customer with all the details of his/her purchase along with the bill amount including discount price and net price.

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

```
class QUALITY
{  private :
            char Material [30];
float thickness;
 protected :
char manufacturer[20];
 public:
       QUALITY( );
       void READ( );
       void WRITE( );
    };
class QTY
{   long order;
  protected:
  int stock;
public:
       double p;
       QTY( );
       void RQTY ( );
       void SQTY( );
```

```
};
class FABRIC: public QTY, protected QUALITY
{   private:
      int fcode,fcost;
    public:
      FABRIC( );
     void RFABRIC( );
      void SFABRIC( );

    };
```

(i) Mention the member names that are accessible by an object of QTY class.

(ii) Name all the data members which can be accessed by the objects of FABRIC class.

(iii) Name the members that can be accessed by the functions of FABRIC class.

(iv) Write the order of constructor invocation for an object of FABRIC.

OR

Consider the following class State :

```
class State
{  int sno;
char name[20];
public :
State( )
 { sno=0;
   strcpy(name,"NA");
   }
void Sinput( )
{ sno++;}
int getsno()
{ return sno; }
};
```

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

Data Members :

Dname string

percapita float

population int

Public Member functions :

Enter( ) : To enter values for Dname, percapita and population.

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

3(a) Write a COLSUM ( ) function in C++ to find sum of each column of a M x N Matrix and display it. **2**

OR

Write a user defined function in C++ to display the values of middle column and middle row of a two dimensional array of size 5x5.

(b) Write a function in C++ which accepts an integer array and its size as arguments / parameters and arrange all the odd numbers in the first row and even 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, 8, 7, 4, 9, 6

The resultant 2-D array is given below

1 7 9 0 0 0

0 0 0 6 4 8

OR

Write the definition for a function 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 (1st, 3rd and 5th) of the two arrays, for example if the array A contains 15,10,21,45,25,77 and if the array B contains 99,77,66,55,33,22. Then the function should make the contents of the array A as 15,77,21,55,25,22 and the contents of the array 99,10,66,45,33,77.

(c) A float array A [20][30] is stored along the row in the memory. If the element A[10][15] is stored at 3000, find out the 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 3 bytes, find the address of element A[20][5], if an element A[10][4] is stored at the memory location 2000.

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

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

OR

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

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

for the conversion:

(TRUE && ! FALSE)|| (FALSE && TRUE)

OR

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

T, F, NOT, AND, T, OR, F, AND

4(a) Assume that a text file named "FILE.TXT" already contains some text written into it. Write a function to print the words whose word length is greater than 7. **2**

OR

Write a function in C++ to count the number of times the letter 'e' or 'E' present in a text file EeEe.txt/

(b) Write a function in C++ to search for a rollno from a binary file "student.dat" and modify his marks with a new mark assuming the binary file is containing the objects of the following class: **3**

```
class STUD
 { int rollno;
   char Name[20];
   float marks;
    public:
  void Enter()
  {cin>>rollno;
   gets(Name);
   cin>>marks;}
 void Display()
{  cout<<rollno<<Name<<marks<<endl;}
int  retroll(){return (rollno);}
 };
```

OR

Write a function in C++ to delete a Toy for a given Toy code from a binary file "TOY.DAT", assuming the binary file is containing the objects of following class:

```
class TOYSHOP
{
int Tcode;       //Toy Code
char Tdetails[20];
public:
int RTcode()
{
return Tcode;
}
void AddToy()
{cin>>Tcode;gets(Tdetails);}
void DisToy()
{cout<<Tcode<<Tdetails<<endl;}
};
```

(c) What will be the output if the file paper.txt already contains the text 'Evaluation'. **1**

```
void main()
{
 fstream F1;
 F1.open("paper.txt",ios::app);
char x;
cin>>x;
F1.put(x);
cout<<F1.tellp();
F1.close();
}
```

OR

What is the purpose of seekp() and seekg( ) functions?

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

(b) Consider the following DEPT and EMPLOYEE tables. Write SQL queries for (i) to (iv) and find outputs for SQL queries(v) and (viii): **4+2**

Table DEPT

DCODE	DEPARTMENT	LOCATION
D01	INFRASTRUCTURE	DELHI
D02	MARKETING	DELHI
D03	MEDIA	MUMBAI
D05	FINANCE	KOLKATA
D04	HUMAN REOURCE	MUMBAI

TABLE EMPLOYEE

Eno	Name	DOJ	DOB	Gender	DCODE
1001	Ranveer	2013-09-02	1991-09-01	MALE	D01
1002	Manisha	2012-12-11	1990-12-15	FEMALE	D03
1003	Javed Ali	2013-02-03	1987-09-04	MALE	D05
1007	Neha K	2014-01-17	1984-10-19	FEMALE	D04
1004	Nilanchana	2012-12-09	1986-11-14	MALE	D01
1005	Nitin	2013-11-18	1987-03-31	MALE	D02
1006	Sara Ali	2014-06-09	1985-06-23	FEMALE	D05

(i) To display Eno, Name, Gender from the table EMPLOYEE in ascending order of Eno.

(ii) To display the Name of all the MALE employees from the table EMPLOYEE.

(iii) To display the Eno and Name of those worker from the table EMPLOYEE who are born between '1987-01-01' and '1991-12-01'.

(iv) To count and display FEMALE employees who have joined after '1986-01-01'.

(v) SELECT COUNT(*), DCODE FROM EMPLOYEE GROUP BY DCODE HAVING

COUNT(*)>1 ;

(vi) SELECT DISTINCT DEPARTMENT FROM DEPT;

(vii) SELECT NAME, DEPARTMENT FROM EMPLOYEE E , DEPT D WHERE E.DCODE = D.DCODE AND ENO<1003 ;

(viii) SELECT MAX(DOJ), MIN(DOB) FROM EMPLOYEE;

6(a) Verify the following using Truth Table : **2**

X+Y.Z=(X+Y).(X+Z)

(b) Draw the Logic Circuit for the following Boolean Expression: **2**

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

(c) Derive a Canonical POS 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	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

(d) Reduce the following Boolean Expression to its simplest form using K-Map: **3**

F (A,B,C,D) = Σ(0,2,3,4,6,7,8,10,12)

7(a) Which type of network (out of LAN, PAN and MAN) is formed, when you connect two mobiles using Bluetooth to transfer a video? **1**

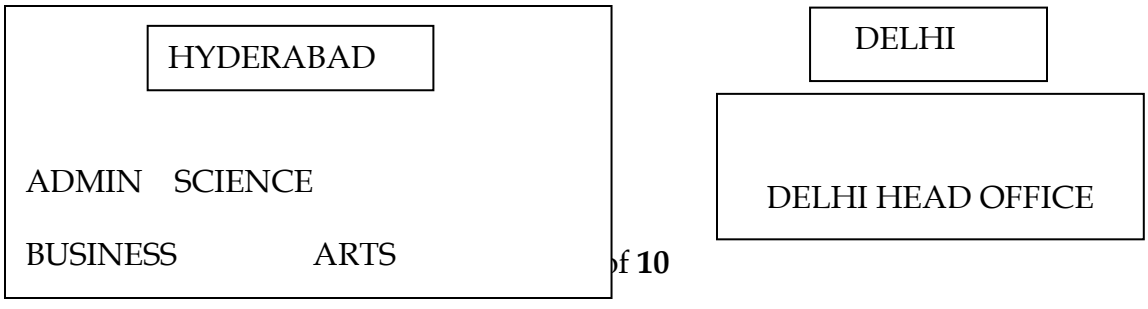
(b) Write two characteristics of Wi-Fi. **1**

(c) Expand the following terms with respect to Networking: **2**

(i) PPP (ii) GSM (iii) XML (iv) HTTP

(d) What is protocol? Which protocol is used to copy a file from/to a remotely located server? **2**

(e) Satya Edu Services Ltd. Is an educational organization. It is planning to set up its India campus at Hyderabad with its head office at Delhi. The Hyderabad campus has 4 main buildings – ADMIN, SCIENCE, BUSINESS and ARTS. You as a network expert have to suggest network related solutions for their problems raised in (i) to (iv), keeping in mind the distances between the buildings and other given parameters. **4**



Distance between the buildings

ADMIN to SCIENCE	65m
ADMIN to BUSINESS	100m
ADMIN to ARTS	60m
SCIENCE to BUSINESS	75m
SCIENCE to ARTS	60m
BUSINESS to ARTS	50m
DELHI head Office to HYDERABAD Campus	1600km

Number of computers

ADMIN	100
SCIENCE	85
BUSINESS	40
ARTS	12
DELHI Head Office	20

(i) Suggest the most appropriate location for the server inside the HYDERABAD campus (out of the 4 buildings), to get the best connectivity for maximum number of computers. Justify your answer.

(ii) Suggest and draw the cable layout to efficiently connect various buildings within the HYDERABAD campus for connecting the computers.

(iii) Which hardware device will you suggest to be procured by the company to be installed to protect and control the internet uses within the campus?

(iv) Which of the following will you suggest to establish the online face-to-face communication between the people in the Admin Office of HYDERABAD campus and DELHI Head Office?

(i) E- Mail

(ii) Text Chat

(iii) Video Conferencing

(iv) Cable TV

End of the Question Paper