Roll Number		

SET C

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) Find the correct identifiers out of the following, which can be used for naming variable, constants or functions in a C++ program: **2**

While, for, Float, new, 2ndName, A%B, Amount2, _Counter

(b) Write the names of the correct header files, which must be included to compile the code successfully: **1**

```
void main()
{
ofstream FIN("GOOD.TXT");
char str2[]="good day";
char str1[]="SIR!";
strupr(str2);
strcat(str1, str2);
FIN<<str1<<endl;
}
```

(c) Rewrite the following C++ code after removing any/all syntactical errors with each correction underlined.*Note* : Assume all required header files are already included in the program. **2**

```
Typedef Count int;
Void main()
{
Count C;
cout<<"Enter the count:";
cin>>C;
for (K = 1; K<=C; K++)
cout<< C "*" K <<endl;
}
```

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

```
void compute(int &Num, int Last=2)
{
 Last=(Last%2==0)?Last+1:Last-1;
  for(int C=1; C<=Last; C++)
  Num+=C;
}

void main()
{
int A=20, B=4;
compute(A,B);
cout<<A<<"&"<<B<<endl;
B--;
compute(B);
cout<<A<<"#"<<B<<endl;
}
```

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

```
void main()
{
char *Text="Chandigarh";
int *Ptr, Num[ ]={2,4,6,8,12,32};
Ptr=Num;
cout<<*Ptr<<Text<<endl;
Text+=2;
Ptr+=2;
cout<<*Ptr<<Text<<endl;
Text+=2;
*Ptr+=4;
cout<<*Ptr++<<Text<<endl;
}
```

(f) Look at the following C++ code and find the possible output(s) from the options (i) to (iv) following it. Also, write the maximum and the minimum values that can be assigned to the variable Y. **2**

```
void main()
 {randomize();
  int Y;
  Y=random(3);
  char STATE[][25]={"KOLKATA","CHENNAI" "DELHI","MUMBAI"};
   for(int I=0;I<=Y;I++)
 {    for(int J=0;J<=I;J++)
cout<<STATE[J];
cout<<endl;   }  }
```

DELHI DELHIMUMBAI DELHIMUMBAIKOLKATA	DELHI DELHIMUMBAI DELHIMUMBAIKOLKATA DELHIMUMBAIKOLKATACHENNAI
MUMBAI MUMBAIKOLKATA MUMBAIKOLKATACHENNAI	DELHI DELHIMUMBAI DELHIMUMBAIKOLKATA

2(a) How member functions and non member functions differ in a C++ program? Support your answer with an example. **2**

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

```
class Science
{
char   Topic[20];
int   Weightage;
public:
Science ( )                //Function   1
{
strcpy (Topic, "Optics" );
Weightage = 30;
cout<<"Topic Activated";
}
~Science( )                 //Function   2
{
cout<<"Topic Deactivated";
}
```

```
Science(Science & S);      //Function 3
};
```

i. In Object Oriented Programming, what is Function 1 referred as and what is function 2 and when does it get invoked/called?

ii. Write the complete function definition for Function 3.

OR

What is the purpose of constructor? Give a suitable example in C++ to illustrate parameterized constructor.

(c) Write the definition of a class Photo in C++ with following description: **4**

Private Members

Pno //Data member for Photo Number (an integer)

Category //Data member for Photo Category (a string)

Exhibit //Data member for Exhibition Gallery (a string)

FixExhibit //A member function to assign Exhibition Gallery as per Category as shown in the following table

Category	Exhibit
Antique	Zaveri
Modern	Johnsen
Classic	Terenida

Public Members

Register() //A function to allow user to enter values for Pno, Category and call FixExhibit() function

ViewAll() //A function to display all the data members

(d) Give the following class definition answer the question that is follow: **4**

```
class Student
{
int Rno ;
char Name[20] ;
 float Marks ;
protected :
void Result ( ) ;
public :
Student ( ) ;
void Register ( ) ;
 void Display ( ) ;
};
class Faculty
{
```

```
 long FCode ;
 char FName [20] ;
 protected :
 float Pay ;
  public :
 Faculty ( ) ;
 void Enter ( ) ;
 void Show ( ) ;
 };
 class Course : public Student, private Faculty
 {
 long CCode [IO];
 char CourseName [50];
  char StartDate [8J, EndDate [8] ;
 public :
 Course ( ) ;
 void Enter();
void Commence ();
void CDetail ();
} ;
```

(i) Write the names of member functions, which are accessible from objects of class Course.

(ii) Write the names of all the data members, which is/are accessible from member function Commence of class Course.

(iii) What is the size of the objects of class Course.

(iv) Which type of Inheritance is illustrated in the above C++ code.

OR

Consider the following class Talent :

```
class Talent
{  int name[20];
protected :
int score;
public :
Talent( ) { strcpy(name,"NA");
            score=1000;}
void input( ) { score+=200;}
int getscore() { return score; }
};
```

Write a code in C++ to derive another class 'Music' in protected mode with the following additional members..

Private Data Members :

Name_Music string

duration float

Protected members:

void Duration( ) : To enter the value of duration

Total_Dur long int

Public Member functions :

void INPUT( ) : To enter value for Name_Music and call function Duration.

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

3(a) Write a user-defined function SUM(int A[][4],int R,int C) in C++ to find and display the sum of all the values, which are ending with 5(i.e., unit place is 5). **2**

For example if the content of array is:

25	56	32	15
57	5	88	35

Display the output as : **Sum is = 80**

OR

Write a function NextElement(int A [ ] [3], int N, int M) in C++ to display all alternate elements from two-dimensional array A (starting from A [0] [0]).

For example : If the array is containing :

23 54 76

37 19 28

62 13 29

The output will be

23 76 19 62 29

(b) Write a function in C++ which accepts an integer array and its size.as arguments and replaces elements having even values with its half and elements having odd values with twice its value. **3**

Example : if an array of five elements initially contains the elements as

3, 4, 5, 16, 9

then the function should rearrange the content of the array as

6, 2, 10, 8, 18

OR

Write a function in C++ which accepts a integer array and its size as an arguments and prints the output (using nested loops) in following format :

Example : if the array is having

1 2 4 5 9

Then the output should be

1

2 2

4 4 4

5 5 5 5

9 9 9 9 9

(c) An array A[20][30] is stored along the row in the memory with each element requiring 4 bytes of storage. If the address of array A[10][8] is 3200, find out the address of A[15][10]. **3**

OR

An array P[20] [50] is stored in the memory along the column with each of its element occupying 4 bytes, find out the 1ocation of P[15][10], if P[0][0] is stored at 5200. Also, find the total number of elements present in this array.

(d) Consider the following portion of a program , which implements a linked stack for Library. Write the definition of function PUSH() to insert a new node in the stack with required information. **4**

```
struct Library
{ int id;
char names[20];
};
class stack
{ Library *top;
public :
stack() { top=NULL; }
void PUSH();
void POP();
}
```

OR

Write a function in C++ to perform Insert operation in a static circular Queue containing Bank's information (represented with the help of an array of structure BANK).

```
struct BANK
{ long Accno;
char  Name [20];
};
```

(e) Convert the following Infix expression to its equivalent Postfix expression, showing the stack contents for each step of conversion. **2**

((A/B) ^ C * (D-E))

OR

Evaluate the following postfix expression using a stack and show the contents of stack after execution of each operation: 10, 3, 2, *, 4, 2, /, -, *

4(a) Write a function in C++ to count the no. of "Me" or "My" words present in the text file "DIARY.TXT" . If the file "DIARY.TXT" contains : **2**

My first book was Me and My family. It gave me chance to meet to the world.

The output of the function should be Count of Me/My in file : 4

OR

Write a function in C++ to count and display the number of lines starting with Alphabet 'A' present in a text file "STORY.TXT".

(b) Write a function in C++ to add more new objects at the bottom of a binary file "stud.dat", assuming the binary file is containing the objects of the following class : **3**

```
class Student
{ int Rno;
char Sname[20];
public:
void Enter()
{ cin>>Rno;
gets(Sname);
}
void show()
{ count << Rno<<sname<<endl;
}
};
```

OR

Write a definition for function DELETE( ) in C++ to read each record of a binary file stud.dat, find and delete those students, who has scored less 33 marks. Assume that the file stud.dat is created with the help of objects of class Student, which is defined below :

```
class Student
{
 int Rno;
char Sname[20];
float marks;
public:
void Enter()
{
 cin>>Rno;
gets(Sname);
cin>>marks;
}
float retmarks()
{
 return(marks);
}
void show()
{ count << Rno<<sname<<endl;
}
};
```

(c) Find the output of the following C++ code considering that the binary file item.dat exists on the hard disk with a list of data of 300 items. **1**

```
class ITEM
{
int ICode;
char IName[20];
public:
void Entry();
void Disp();
};
void main()
{
fstream F1;
F1.open("item.dat",ios::binary|ios::in);
ITEM I;
F1.seekg(0,ios::end);
cout<<"Total Count: "<<F1.tellg()/sizeof(I)<<endl;
F1.seekg(70*sizeof(I));
F1.read((char*)&I, sizeof(I));
F1.read((char*)&I, sizeof(I));
cout<<"At Product:"<<F1.tellg()/sizeof(I) + 1;
F1.close();
}
```

OR

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

5(a) Observe the following table ITEM and answer the parts(a) and(b) accordingly **2**

TABLE ITEM

Code	Item	Qty	Price	Transaction Date
1001	Plastic Folder 14”	100	3400	2014-12-14
1004	Pen Stand Standard	200	4500	2015-01-31
1005	Stapler Mini	250	1200	2015-02-28
1009	Punching Machine Small	200	1400	2015-03-12
1003	Stapler Big	100	1500	2015-02-02
1002	Lead pencil	300	200	2015-01-31

a. Write the names of most appropriate columns, which can be considered as candidate keys.
b. What is the degree and cardinality of the above table?

(b) Consider the following tables **SHOPPE and CLUB.** **4+2**

Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii).

Table : SHOPPE

ID	SNAME	Area
S01	ABC Computronics	CP
S02	All Infotech Media	GK II
S03	Tech Shoppe	CP
S04	Geeks Techno Soft	Nehru Place
S05	Hitech Tech Store	Nehru Place

Table: ACCESORIES

No	Name	Price	Id
A01	Mother Board	12000	S01
A02	Hard Disk	5000	S01
A03	Keyboard	500	S02
A04	Mouse	300	S01
A05	Mother Board	13000	S02
A06	Keyboard	400	S03
A07	LCD	6000	S04
A08	LCD	350	S05
A09	Mouse	350	S05
A10	Hard Disk	4500	S03

(i) To display Name and Price of all the Accessories in descending order of their price.

(ii) To display Id and SName of all Shoppe located in Nehru Place.

(iii) To display Minimum and Maximum Price of each Name of Accessories.

(iv) To display Name, Price of all Accessories and their respective SName where they are available.

(v) SELECT DISTINCT NAME FROM ACCESSORIES WHERE PRICE>=5000;

(vi) SELECT AREA, COUNT(*) FROM SHOPPE GROUP BY AREA ;

(vii) SELECT COUNT (DISTINCT AREA) FROM STORE;

(viii) SELECT NAME , PRICE*0.05 DISCOUNT FROM ACCESSORIES WHERE SNO IN ('SO2','S03') ;

6(a) State any one Distributive Law of Boolean Algebra and Verify it. **2**

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

((U + V').(U + W)). (V + W')

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

M	N	P	F(M,N,P)
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	0

3

(d) Reduce the following Boolean Expression to its simplest form using K-Map:
F(A,B,C,D)= Σ (0,1,2,3,4,5,8,10,11,14)

7(a) David opened his e-mail and found that his inbox was full of hundreds of unwanted mails. It took him around two hours to delete these unwanted mails and find the relevant ones in his inbox. What may be the cause of his receiving so many unsolicited mails? What can David do to prevent this happening in future? **2**

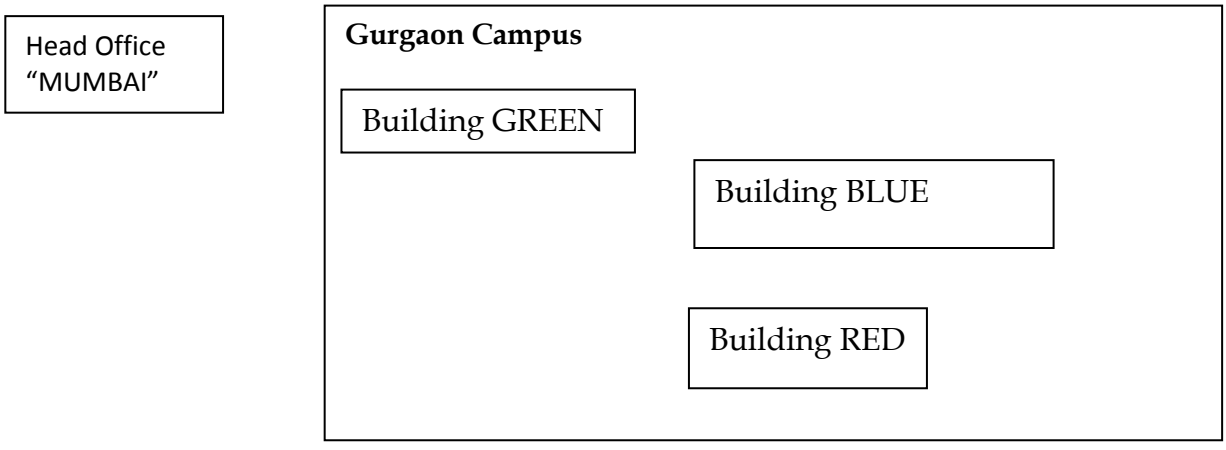
(b) Assume that 200 employees are working in an organization. Each employee has been allotted a separate workstation to work. In this way, all computers are connected through the server and all these workstations are distributed over two cities In each city, all the computers are connected to a switch. Identify the type of network? **1**

(c) Explain the difference between guided and unguided media. **1**

(d) Write the expanded names for the following abbreviated terms used in Networking and Communications: **2**

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

(e) Workalot Consultants are setting up a secured network for their office campus at Gurgaon for their day-to-day office and web-based activities. They are planning to have connectivity between 3 buildings and the head office situated in Mumbai. Answer the questions (i) to (iv) after going through the buildings positions in the campus and the other details, which are given below: **4**



Distance between various buildings

Building "GREEN" to Building "RED"	110 m
Building "GREEN" to Building "BLUE"	45 m
Building "BLUE" to Building "RED"	65 m
Gurgaon Campus to Head Campus	1760 KM

Number of computers

Building "GREEN"	32
Building "RED"	150
Building "BLUE"	45
Head Office	10

(i) Suggest the most suitable place (i.e. building) to house the server of this organization. Also give a reason to justify your suggested location.

(ii) Suggest a cable layout of connections between the buildings inside the campus.

(iii) Suggest the placement of the following devices with justification:

(1) Switch

(2) Repeater

(iv) The organization is planning to provide a high speed link with its head office situated in MUMBAI using a wired connection. Which of the following cables will be most suitable for this job?

(1) Optical fibre

(2) Co-axial fibre

(3) Ethernet cable

End of the Question Paper