Roll Number		

SET C

INDIAN SCHOOL MUSCAT
FINAL EXAMINATION
COMPUTER SCIENCE

CLASS: XII | Sub. Code: 283 | Time Allotted: 3 Hrs.

21.11.2019 | Max. Marks: 70

General Instructions:
(a) All questions are compulsory.
(b) Programming language is C++
(c) Questions 4 (a), 6 (b and c), 7 (c and d) and 8 (b) 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( )
{ float Last =26.5698742658;
  cout<<setw(5)<<setprecision(7)<<Last ; }
```

(b) Rewrite the following C++ program after removing any/all syntactical error(s). 2
Note: Assume all required header files are already included in the program.

```
void main( )
int A[7];
A=[3,2,5,4,7,9,10];
for( int p = 0; p<=6; p++)
{ if(A[p] %2 = 0)
int S = S + A[p] ; }
cout<<S; }
```

(c) Find the correct identifiers out of the following, which can be used for naming variable, constants or functions in a C++ program: 2
int, Float, while, Switch, case, New , price*qty, Avg_25

(d) Observe the following C++ code and find out , which out of the given options i) to iv) are the expected correct output. Also, write the maximum and minimum value that can be assigned to the variable 'Go'. 2
Note: Assume all required header files are already included in the program.

```
void main()
{ int X [4] ={100,75,10,125};
  int Go = random(2)+2;
 for (int i = Go; i< 4; i++)
  cout<<X[i]<<"$$";
}
```

(i) 100$$75 (ii) 75$$10$$125$$ (iii) 75$$10$$ (iv) 10$$125$

(e) Find and write the output of the following C++ program code: 3

Note: Assume all required header files are already included in the program.

```
void switchover(int A[ ],int N, int split)
{
    for(int K = 0; K< N; K++)
      if(K< split)
       A[K] += K ;
      else
      A[K] *= K ;
}
void display(int A[ ] , int  N)
{
  for(int K = 0; K<N; K++)
     (K%2== 0) ?cout<<A[K]<<"%" : cout<<A[K]<<endl;
}
void main( )
{ int H[ ] = {30,40,50,20,10,5};
  switchover(H, 6, 3) ;
  display(H, 6) ; }
}
```

(f) Find and write the output of the following C++ program code: 3

Note: Assume all required header files are already being included in the program.

```
void main( )
{  int  M[  ] = {300, 25, 30, 35,40};
   int *Point = M ;
   while( *Point < 30)
   {  if( *Point%3 !=0)
        *Point = *Point + 4 ;
    else
        *Point = *Point + 2;
     Point++ ;
   }
   for(int J = 0; J<=4 ; J++)
   { cout<< M[J]<<"*";
     if(J% 3 = = 0) cout<<endl ; }
   cout<< M[4] * 3<<endl ;   }
```

2(a) Explain polymorphism in context of Object Oriented Programming. Also give a supporting example in C++. 2

(b) Write two differences each between procedural programming and object oriented programming. 2

3(a) Write the definition of a class TRAVEL in C++ with following description: 4

Private members:

PC - Plan code of type long integer

PT - Place of travel of type characters array

NT – Number of travelers of type integer

NOB – Number of buses of type integer

Public members:

A function Newplan( ) which allows user to enter PC , PT and NT and also assign the NOB as per

the following conditions:

NT(Number of travelers)	NOB(Number of buses)
less than 20	2
equal to and more than 20 and less than 40	3
equal to and more than 40	4

A function Show( ) to display the contents of all the data members on the screen.

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

```
class HDD
{ char  Brand[25] ;
  float  Price  ;
 public:
 HDD(char C[ ], float P)        // Function 1
  { strcpy(Brand, C) ;
    Price = P ;
  }
 HDD(HDD  &H) ;                 // Function 2
} ;
```

(i) Create an object, such that it invokes Function 1.
(ii) Write the complete definition for Function 2.

OR

(a) What is a copy constructor? Illustrate with a suitable C++ example. 2

(b) Write any four special characteristics of constructors. 2

5(a) Answer the questions (i) to (iv) based on the following code segment: 4

```
class GOODS
{ int  id ;
protected :
  char  name[20] ;
  long  qty ;
  void  Incr(int  n) ;
public :
   GOODS( );
  ~GOODS( );
void Get( );  } ;
class FOOD_PRODUCTS : public GOODS
{ char   exp_dt[10] ;
  protected :
   int   fid;
   int   fqty;
   public :
    void  Getd( );
    void Showd( ); };
```

```
class COSMETICS : private GOODS
{ int qty;
  char exp_date[10];
 protected :
    int cid;
  public :
    ~COSMETICS( );
     COSMETICS( );
void Show();
};
```

i) How many bytes will be required by an object of class FOOD_PRODUCTS.

ii) Name the member functions accessible through the object of class FOOD_PRODUCTS.

iii) From the following, Identify the member function(s) that cannot be called directly from the object of class COSMETICS.
Show(), Getd( ), Get( )

iv) If the class COSMETICS inherits the properties of FOOD_PRODUCTS class also, then name the type of inheritance.

6(a) Write a function void Count( ) in C++ to read the content of a text file "MESSAGES.TXT" and count the words "He" and "She" as independent words in the file and display the count of each separately(the words are not case sensitive). 2

If the file "MESSAGES.TXT" content is as follows:
He is playing in the playground. She is playing with her dolls.
The output:
The count of He: 1
The count of She: 1

(b) Write a user defined function TotPrice( ) in C++ to read each object of a binary file "PRODUCT.DAT", and display the Name from all such records whose price is above 200. Assume that the file "PRODUCT.DAT" is created with the help of objects of class Product, which is defined below: 4

```
class Product
 { char Name[20] ; float Price ;
 public:
    char *RName( ) { return Name ; }
    float  RPrice( ) { return Price ; }
  };
```

OR

(b) A binary file PATIENT.DAT contains records as objects of the following class: 4

```
class Patient
 { int PNo ; char Name[20] ; float Fees ;
 public:
    int GetNo( ) { return PNo ; }
    void Show( )
     { cout<<PNo<< " * "<<Name<< " * "<<Fees<<endl ;
```

};

Write a user defined function Details(int M) in C++ which displays the details of the Patient from the binary file "PATIENT.DAT", whose PNo matches with the parameter M passed to the function.

(c) Observe the program segment given below carefully and the questions that follow. Assume all header files are included in the program. 1

```
class Stock
{
int Ino, Qty; char Item [20] ;
public:
void Enter( ) {cin>>Ino; gets (Item) ; cin>>Qty:}
void Issue(int Q) {Qty += Q ; }
void Purchase(int Q) {Qty -= Q; }
int GetIno() {return Ino;}
} ;
void PurchaseItem (int Pino, int PQty)
{
fstream File;
File. open ("STOCK.DAT", ios::binary|ios::in|ios::out);
Stock  S ;
int Success =0;
while (Success ==0 && File.rea((char*)&S, sizeof(S)))
{
if (Pino == S. GetIno())
{S. Purchase (PQty) ;
_____ // Statement 1
_____ // Statement 2
Success ++;
}
}
if (Success == 1)
cout<<"Purchase Updated"<<endl;
else
cout<<"Wrong Item No<<endl.;
File.close( ) ;}
```

i) Write statement 1 to position the file pointer to the appropriate place, so that the data updation is done for the required Item.

ii) Write statement 2 to perform the write operation so that the updation is done in the binary file.

OR

(c) What is the difference between tellg( ) and seekg( ) ? 1

7(a) Write a function BSearch(int A[ ] int size, int N) which search for an integer using binary search method in an array A. Display the position of the number in the array A if found in the array and if the number is not present in the array then display "Number not Found". 3

(b) Write a function Insertion_Sort(int Num[ ], int N) to sort the array Num in ascending order using Insertion sort and display the sorted array. 3

(c) Write the definition of a function Increase_Score(int score [], int size) in C++, which should check all the elements of the array and give an increase of 5 to those scores which are less divisible by 5. 3
Example: if an array of seven integers is as follows:
45, 35, 85, 80, 33, 27, 91
After executing the function, the array content should be changed as follows:
50, 40, 90, 85, 33, 27, 91

OR

(c) Write definition for a function ROWSUM(int A[][5],int R , int C) in C++ to display the row sum of each row separately of the matrix A. 3
For example, if the content of array is as follows:

10	40	70
20	50	80
30	60	90

The function should display the following as output
ROW1: 120
ROW2: 150
ROW3: 180

(d) An array T[15][10] is stored in the memory along the row with each of the element occupying 8 bytes, find out the memory location for the element T[10][7], if the base address of the array is 12000. 3

OR

(d) An array S[20][50] is stored in the memory along the column with each of the element occupying 4 bytes, find out the memory location for the element S[15][10], if the base address of the array is 5200. 3

8(a) Write the definition of a member function POP( ) for a class STORE in C++ to add a book information in a dynamically allocated stack of books considering the following code is already written as a part of the program: 3

```
struct Book
{ int bookid;
  char bookname[20];
  Book *next; } ;
class STORE
{  Book *Top;
public:
  STORE( )
  { top = NULL; }
   void PUSH( );
   void POP( );
  ~STORE( );
};
```

(b) Write the definition of a member function QINSERT( ) for a class QUEUE in C++, to insert a product to a dynamically allocated Queue of products considering the following code is already written as a part of the program. 3

```
struct PRODUCT
{   int PID;
    char PNAME[20];
    PRODUCT *Next;
};
class QUEUE
{   PRODUCT *Rear,*Front;
public:
 QUEUE( ){Rear = NULL; Front =NULL;}
  void  QINSERT( );
  void  QDELETE( );
 ~QUEUE( );
};
```

OR

(b) Write the definition of a member function QDELETE( ) for a class QUEUE in C++, to remove a product from a dynamically allocated Queue of products considering the following code is already written as a part of the program. 3

```
struct PRODUCT
{   int PID;
    char PNAME[20];
    PRODUCT *Next;
};
class QUEUE
{   PRODUCT *Rear,*Front;
public:
 QUEUE( ){Rear = NULL; Front =NULL;}
  void QINSERT( );
  void QDELETE( );
 ~QUEUE( );
};
```

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

P + (Q – R) * S / T

9(a) What do you mean by attribute and domain in context of a table in RDBMS? 2

(b) What do you mean by Primary key and Candidate key? 2

Write SQL commands for the queries (i) to (viii) and output for (ix) to (xii) based on the tables Books and Issued given:

Table: **Issued**

Book_Id	Quantity_Issued
T0001	4
C0001	5
F0001	2

Table: **Books**

Book_Id	Bookname	Author_name	Publisher	Price	Type	Quantity
C0001	Fast Cook	Lata Kapoor	EPB	355	Cookery	5
F0001	The Tears	William Hopkins	First Publ.	650	Fiction	20
T0001	My First C++	Brain & Brooke	EPB	350	Text	10
T0002	C++Brain works	A.W. Rossaine	TDH	350	Text	15
F0002	Thunderbolts	Anna Roberts	First Publ.	750	Fiction	50

i) To show book name, Author name and price of books of First Publ. 1

ii) To list the names from books of text type. 1

iii) To Display the names and price from books in ascending order of their prices. 1

iv) To increase the price of all books of EPB publishers by 50. 1

v) To display the Book_Id, Bookname and quantity issued for all books which have been issued. 1

vi) To display the count of books publisher wise. 1

vii) To display the average price of the books. 1

viii) To insert a new row in the table Issued having the following data. 'F0003', 1 1

ix) select count(*) from Books ; ½

x) select max(Price) from books where quantity >=15 ; ½

xi) select Bookname, Author_name from books where publishers= 'EPB' ; ½

xii) select count(distinct publishers) from books where Price>=400 ; ½

End of the Question Paper