



# INDIAN SCHOOL MUSCAT HALF YEARLY EXAMINATION

## COMPUTER SCIENCE

CLASS: XII

Sub. Code: 083

Time Allotted: 3 Hrs

20.09.2017

Max. Marks: 70

**General Instructions:**

- Answer all questions
- Programming language is C++

- 1.a What is the difference between automatic type conversion and type casting? Explain with 2 examples
- b. Write the names of the header files to which the following belong: 1
- (i) exit() (ii) setprecision()
- c. Rewrite the following program after removing the syntactical errors (if any). Underline each 2 correction.

```
#include <iostream.h>
struct Memory
{ char drive = 'C' ;
  float Size ;
  int Partitions ;
} D1;
```

```
Void main()
{ cout<< "\n Enter drive name :"; gets(D1.drive) ;
  cout<< "\n Enter drive size and number of partitions :";
  cin>>D1.Size>>D1.Partitions;
}
```

- d. Find the output of the following program: 2
- Note: Assume all required header files are already included in the program.

```
void Execute(int &X, int Y = 200)
{ int TEMP = X + Y ;
  X += TEMP ;
  if( Y!= 200)
    cout<< TEMP << X << Y << endl ;
}
void main( )
{ int A = 50 , B = 20 ;
  Execute(B) ;
  cout<< A << B << endl ;
  Execute(A, B) ;
  cout<< A << B << endl ;
}
```

- e. Find the output of the following program:

2

```
#include<ctype.h>
#include<iostream.h>
void main()
{ char Text[ ]= "TALenT@or";
  for(int I = 0 ;Text[ I ] !='\0' ; i++)
  { if( !isalpha(Text[ i ]))
    Text[ i ] = '*';
    else if(!isupper(Text[ i ]))
    Text[ i ] = Text[ i ] + 1;
    else Text[ i ] = Text[ i + 1];
  }
  cout<<Text ;
}
```

- f. Find out the expected correct output(s) from the options (i) to (iv) for the following C++ code.

3

```
#include <iostream.h>
#include <stdlib.h>
void main()
{ char serial[ ] = { 'E', 'X', 'A', 'M' };
  int number [ ] = { 69,66,67,68 };
  randomize();
  cout<<number[random(3)];
  for( int I = 0; i < 4; i++)
  cout<<serial[sizeof(int) + random(2) -1];
}
```

(i) 67XXAX

(ii) 69AEXA

(iii) 66AAXA

(iv) 68AAAX

- g. Find the and write the output of the following C++ program code:

3

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

```
typedef char TEXT[80] ;
void JumbleUp(TEXT T)
{ int L = strlen(T) ; int C ;
  for( C = 0 ; C < L - 1 ; C += 2)
  { char CT = T[ C ] ;
    T[ C ] = T[ C + 1 ] ;
    T[ C + 1 ] = CT ;
  }

  for( C = 1 ; C < L ; C += 2 )
  { if( T[ C ] >= 'M' && T[ C ] <= 'U' )
    T[ C ] = '@' ;
  }
}
```

```

void main ()
{ TEXT Str = "HARMONIOUS";
  JumbleUp(Str);
  cout << Str << endl ;
}

```

2.a Differentiate between data abstraction and data hiding. 2

b. Define i) Inheritance      ii) Polymorphism      iii) Encapsulation 3

3.a How is matching done in case of overloaded functions? 2

b. Prototypes of six overloaded functions are given below: 3

```

void callme(int , float ) ; // function 1
void callme(char , float ) ; // function 2
void callme(double) ; // function 3
void callme(long , float ) ; // function 4
void callme(float) ; // function 5
void callme(long double) ; // function 6

```

Explain which function will be called for each of the following calls and if any ambiguity or error, why.

- a) callme(4, 66);
- b) callme(5.3, 44);
- c) callme('a', 56);
- d) callme(33F, 44F);
- e) callme(88);
- f) callme(85.334);

4.a Define a class **MARKER** with the following specifications : 4

**Private members:**

Product\_code character(6), Brand\_name character(15), Price float, Product\_type character(25), Category character(20).

A function Assign() which assigns category of the product based on the following condition :

<b>Price</b>	<b>category</b>
<10000	Economy
>=10000 < 30000	Elegant
>=30000	Luxury

**Public members:**

A default constructor to assign initial values of product\_code as ST200, brand\_name as "SONY", product\_type as 'L', price as 10000 and category

"Economy". A function Getdata() to accept Product\_code, Brand\_name, Price, Product\_type and invoke the function Assign() to assign the Category.  
A function Display() to display all the details of a product.

b. Define a class **HANDSET** with the following specifications : 4

**Data Members:**

Make - of string type  
Model - of type string

Price - of type long int

Rating - of type char

**Member Functions:**

A parametrized constructor to initialize all data members with valid initial values.

A function Read\_Data() to read an object of Handset type.

Function Display() to display the details of an object of type Handset type.

Function RetPrice() to return the value of Price of an object of Handset type.

c. What is the difference between public, private and protected visibility modes of a class in context to Object Oriented Programming? Explain with a suitable example. 2

d. What do you mean by a static data member of a class? How is it different from an ordinary data member? 2

e. Find the output of the following code: 3

```
#include<iostream.h>
class METRO
{ int Mno, TripNo, PassengerCount;
public:
METRO(int Tmno=1)
{ Mno= Tmno;
TripNo = 0;
PassengerCount = 0 ;
}
void Trip(int PC = 20)
{
TripNo++;
PassengerCount += PC ;
}
void StatusShow()
{
cout<< Mno << ":" << TripNo << ":" << PassengerCount << endl ;
}
};
void main( )
{ METRO M (5) ,T ;
M.Trip( ) ;
T.Trip( 50) ;
M.StatusShow( ) ;
M.Trip( 30) ;
T.StatusShow( ) ;
M.StatusShow( ) ;
}
```

5.a Write any four characteristics of a constructor. 2

b. Answer the questions (i),(ii) and (iii) after going through the following class: 3

```
# include <iostream.h>
# include <conio.h>
# include<string.h> -
```

```

class Book
{
int Bookno, char BookTitle[25], float Price ;

public:
Book () // Function 1
{
Bookno = 112 ;
strcpy(BookTitle, "Question Bank in C++");
Price = 200.00 ;
}
Book (Book &T); // Function 2
void Buy() ; // Function 3
~Book() ; // Function 4

};
void main()
{ }

```

- i. What OOP feature is demonstrated by Functions 1 and 2?
- ii. Write the statements to create objects which invoke Functions 1 and 2.
- iii. Name Function 4 and when is it invoked.

6.a Differentiate between Hierarchical and Multiple inheritances. 2

b. Give the following class definition answer the question that follows: 3

```

class University
{ char uname [20];
protected :
char vc[20] ;

public :
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 HOD[20];
public :
    void fetchdata();
    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 will be the size of an object (in bytes) of class Department?

7.a Observe the program segment given below carefully and fill the blanks marked as Statement1 and Statement2 using any of function seekp(),seekg(),tellg(),tellp(), read() and write() functions for performing the required task.

```

#include <fstream.h>
class Elections
{
    long Cid; char Cname[20], float Votes;
public:
    void Enter(); //Function to enter the details of a record

    void Display(); //Function to display the content of a particular record number

    void NewVotes() // Function to accept updated new Votes
    { cin>>Cid; gets(Cname); cin>> Votes; }

    long R_Cid() {return Cid; } // Function returns Candidate ID
};

void Update(long id) // Function to update the new Votes
{
    fstream File;
    File.open("CANDIDATE.DAT",ios::in|ios::out|ios::binary);
    Elections E;
    int Record = 0, Found = 0;
    while(!Found && File.read((char *) &E, sizeof(E)))
    {
        if( Id == E.R_Cid()
        {
            cout<< "\nEnter latest votes:";
            E.NewVotes();
            _____ // Statement 1
            _____ // Statement 2
            Found = 1;
        }
        Record++;
    }
    File.close();
}

```

```

if(Found==1)
    cout<< "\nRecord Updated" ;
}

```

- b. Write a function Count() in C++ which reads a text file "Poem.txt" and counts the number of occurrence of the words 'he' and 'she' ('he' and 'she' are not case sensitive and they should be separate words) in it and display their number of occurrence separately. 2
- c. Write a function in C++ to search and display details of all trains whose destination is "Delhi" from a binary file "TRAIN.DAT". Assuming the binary file is containing the objects of the following class. 3

```

class TRAIN
{
    int Tno; // Train Number
    char From[20]; // Train-Starting point
    char To[20]; // Train-Destination

public:
    char *GetFrom() { return From ; } // returns starting location
    char *GetTo() { return To ; } // returns destination
    void Input(){cin>>Tno;gets(From); gets(To) ;}
    void Display(){cout<<Tno<<From<<To<<endl;}
};

```

- d. Write a function Update() which reads and updates the salary of an Employee in a binary file "EMPLOYEE.DAT" containing records of the following structure. 3
- ```

struct Employee
{ char name[20];
  int salary; };

```
- The name of the employee whose salary is to be updated is inputted during run time.

- 8.a Write a function SEARCH() in C++ to search for a given number from the array NUM in ascending order of size 'S' using binary search. The array NUM, its size S and the number to be searched N are passed as argument to the function. 2
- b. Write a function SORT() to sort an array of 10 integers in ascending order using the technique of bubble sort. The array and its size are passed as argument to the function. 3
- 9.a What is a freeware? 1
- b. Explain the use of switch and bridge in a network. 2
- c. What is the difference between a hacker and a cracker? 2

**End of the Question Paper**