



OXFORD PUBLIC SCHOOL, RANCHI
HALF YEARLY EXAMINATION
SESSION 2016-2017

Class – XII

Sub – Computer Science

Name _____

Class & Sec _____

Time: 3 Hrs

F.M.: 70

Roll No _____

1. (a) Find the correct identifiers out of the following, which can be used for naming variables, constants or functions in a C++ program:
File-Rec, pattern.1, New#2, isSpace, goto, getch, NULL [2]
- (b) Observe the following program code carefully and write the names of those header file(s), which are essentially required to compile and execute the following program successfully. [1]
- ```
typedef char Str[80];
void main()
{ Str Char[] = "1st Term Exam!";
int c=0;
while(Char[c]!='\0')
if(isalnum(Char[c]))
Char[++c]=' '
else
Char[c++] = '%';
cout<<setw(15)<< " "<<Char;}
```
- (c) Rewrite the following program code after removing the syntax error(s) (if any). Underline each correction. [2]
- ```
#Define cube(a) = a+a+a;  
int main()  
{ Float x=2f;  
if(cube(x)=8)  
cout<< "cube=",a*a*a; cout<<endl; }
```
- (d) Find the output of the following program.(Assume all the required header files are included). [3]
- ```
#include<iostream.h>
void Alter(int *N,int c)
{
for(int i=1;i<c;i++)
(N+i-1)=(N+i)+1;
}
void main(){
int p[]={6,9,8},q[]={4,3,1},r[]={50,80};
Alter(p,3);
Alter(q,3);
Alter(r,2);
for(int i=0;i<3;i++)
cout<<p[i]<<'-';
cout<<endl;
for(int i=0;i<3;i++)
cout<<q[i]<<'%';
cout<<endl;
for(int i=0;i<2;i++)
cout<<r[i]<<'-';
cout<<endl; }
```
- (e) Find the output of the following program segment.(Assume all the required header files are included). [2]
- ```
void Practice(int &M, int N=5)  
{ M+=N; N*=M; }  
void main()  
{ int A=2, B=5;  
Practice(A,B);  
cout<<A<< " "<<B<<endl;  
Practice(A);  
cout<<A<< " "<<B<<endl; }
```
- (f) Find the output of the following program segment.(Assume all the required header files are included). [3]
- ```
class Bonus{ char Grade;
static int points;
public : Bonus()
{ Grade= 'G'; points++; }
void UP()
{ Grade+=points; }
```

```

void Down()
{ Grade-=points; }

void Display()
{ cout<<Grade<< "#"<<points<<endl;};

int Bonus::points=3;
void main()
{ Bonus B1,B2;
 B1.UP(); B1.UP(); B2.Down();
 B1.Display(); B2.Display();
 B1.Down(); B2.UP();
 B1.Display(); B2.Display(); }

```

- (g) Study the following program and select the possible output(s) from it. Also, write the maximum and the minimum values that can be assigned to the variable fly when i=3. [2]

```

#include<iostream.h>
#include<stdlib.h>
void main()
{ randomize();
 char City[][10]={"DEL","KOL","MUM","BNG","CHN"};
 int fly;
 for(int i=4;i>1;i--)
 { for(j=0;j<i;j++)
 {
 fly=random(i)+1;
 cout<<city[fly]<<":";
 }cout<<endl;
 }
}

```

|                                                 |                                                 |
|-------------------------------------------------|-------------------------------------------------|
| 1. KOL:KOL:KOL:KOL:<br>KOL:KOL:KOL:<br>KOL:KOL: | 2. DEL:KOL:MUM:BNG:<br>KOL:MUM:BNG:<br>MUM:BNG: |
| 3. KOL:KOL:KOL:<br>KOL:KOL:KOL:<br>KOL:KOL:KOL: | 4. BNG:KOL:CHN:MUM:<br>MUM:KOL:BNG:<br>MUM:MUM: |

2. (a) What is copy constructor? How is it different from parametrized constructor? Give an example in C++ to illustrate in context of Object Oriented Programming. [2]

- (b) Answer the questions (i) to (iii) after going through the following class: [3]

```

class Flight{
 int duration; // in hours
 char *Fname;
public:
 Flight() //function1
 { Duration=8; cout<<"\n inauguration";}
 ~Flight() //function2
 { cout<< "concluding ceremony"; }
 void Journey(int s=1) //function3
 { cout<<"Journey no"<<s; }
 Flight(int d,char *r) //function4
 {
 duration=d; strcpy(Fname,r);
 cout<<"inauguration at"<<duration<< "@"<<Fname;
 }
};

```

- i) As per OOPs, which concept is illustrated by Function1 and Function4 together?  
 ii) What is Function2 specifically referred as? When do you think Function2 will be invoked/called?  
 iii) Write C++ statement to invoke Function 4 .
- (c) Define a class Library in C++ with the following descriptions: [4]

**Private Members:**

- Bcode of type Integer
- Description of type String with 20 characters
- No\_of\_Pages of type Integer
- Price of type Float
- A member function Calculate() to calculate and return the Price( as No\_of\_Pages\*0.65 ).

**Public Members:**

- A constructor to initialize Bcode as 00, Description as "Empty", No\_of\_Pages as 0 and Price as 0.0 .

- A function Enter ( ) to allow user to enter values for Bcode, Description, No\_of\_Pages and call function Calculate() to calculate the price of book.
- A function Display() to allow user to view the content of the data members.

(d) Answer the questions (i) to (v) based on the following:

[5]

```
class Trainer{
 char Tno[5],Tname[10],Specialization[10];
 int days;
protected:
 float Renumeration;
 void Assign(float);
public:
 Trainer();
 void TEntry();
 void TDisplay();
};
class Learner: protected Trainer
{
 char Regno[10],Lname[20];
protected:
 int Attendance,Grade;
 void Credit();
public:
 Learner();
 void LEntry();
 void LDisplay();
};
class Institute:public Learner
{
 char ICode[10],IName[20];
public:
 Institute();
 void IEntry();
 void IDisplay();
};
```

- Name the members accessible by IEntry ( ) of class Institute.
  - What will be the size of an object (in bytes) of class Institute?
  - Name the members accessible by an object of class Learner.
  - Which type of Inheritance is discussed in the above example?
  - If the class Learner is derived privately from the base class Trainer and class Institute publically from class Learner , then which members will be accessible by member function of class Institute?
3. (a) Write a function SelSort ( ) that accepts an integer array along with its size and arrange the numbers in descending order . [3]
- (b) An integer array T[50][20] is stored in the memory along the column. Find the location of T[30][5], if T[10][15] is stored at 1000. Also find the Base address. [3]
- (c) Write a function ASUM ( ) in C++ that accept a 2-D array along with its row and column size and find the sum of numbers ending with 4. [3]

**For Example : If the array consists of**

|    |    |    |
|----|----|----|
| 2  | 4  | 40 |
| 34 | 3  | 14 |
| 17 | 10 | 24 |

**Then, the output should be 76(4+34+14+24)**

(d) Each node of a STACK contains the following information, in addition to a pointer field:

[1+2×4=9]

- Name of a City
- Pincode of the City

Define the structure of node for the linked STACK in question. TOP is a pointer that points to the topmost node of the STACK. Write the following functions:

- PUSH() To push a node into the STACK, which is allocated dynamically.
- TRAVERSE() To visit and display the contents of each node.

(e) Write a function in C++ to perform DELETE operation to delete a node from a dynamically allocated queue whose structure has been defined below:- [4]

```
struct NODE{
 int Cno; //Client Number
 char Cname[20]; //Client Name
 NODE *Next;};
class Queue{
 NODE *front , *rear;
public : Queue() { front=rear=NULL; }
```

```

void QINSERT();
void QDELETE();
void QDISP();

```

```
};
```

- (f) Evaluate the following postfix notation of expression: [2]  
**True, False, NOT, AND, False, True, OR, AND, False, False, NOT, OR, AND**
- (g) Convert the following infix expression to its equivalent postfix expression showing stack contents for the conversion:[2]  
**(A\* (B + C - D) / (E ↑ F) / G) \* H**
- (h) Write a function void Merge(int A[ ], int B[ ], int C[ ], int m, int n) that will merge two arrays A, B of size m, n respectively to array C, where Array A is in descending order and B is in ascending order and the resultant array C will be in descending order. [4]

4. (a) Observe the program segment given below and answer the questions that follows:- [2]

```

class Train{
 int TrainNo;
 char *Tname; //Train Name
 float charges;
public :
 void TInput(); //To enter details
 void Tdisplay(); //To display details
};
void main()
{
 fstream fi;
 fi.open("TRAIN.DAT", ios::binary| ios::in);
 Train T;
 _ _ _ _ _ ; //Statement1
 _ _ _ _ _ ; //Statement2
 _ _ _ _ _ ; //Statement3
 fi.close();
}

```

If initially the file pointer is at 15th record, then write Statment1, Statement2 and Statement3 in appropriate order to read and display 9th record of the file.

- (b) Write a function VOWEL( ) in C++ to display all those lines which are starting with a vowel in reverse order from a text file "TERM.TXT". [3]

**For ex, If the file contains :**

```

This is my new class
I am loving it
U are also enjoying

```

**Then, the output should be :**

```

ti gnivol ma I
gniyojne osla era U

```

- (c) Write a function Count( ) to count and display the palindrome words from a text file "COMPLETE.TXT". [3]

**For ex, If the file contains :**

```

I love my MOM & DAD.
From BOB.

```

**Then, the output should be :**

```

MOM, DAD, BOB
Total Palindrome words = 3

```

- (d) Given a binary file GALLERY.DAT, containing records of the following class Gallery type: [3]

```

class Gallery
{
 int Number;
 char Painter_name[20], Category;
public:
 void Enter()
 { gets(Painter_name); cin>>Number; Category=getche();}
 void Reward()
 {cout<<Number<< " : "<<Painter_name<< "@"<<Category;}
 char Rcatg()
 {return Category;}
 char *RPName() { return Painter_name; }
};

```

Write a function in C++ to search and display records of those paintings which belong to category 'A' or 'B' and Painter's name start with 'S' from a binary file "GALLERY.DAT". Assuming that the binary file contain records of class Gallery as defined above.