

SHRI SHIKSHAYATAN SCHOOL  
MID TERM (CLASS-XII 2017)  
COMPUTER SCIENCE (083)

Time allowed : 3 Hours

Maximum Marks: 70

1.(a) Answer the questions (i) and (ii) after going through the following C++ class:

[2]

```
class Stream
{
intStreamCode : char Streamname[20];float fees;
public:
Stream() //Function 1
{
StreamCode=1; strcpy (Streamname,"DELHI");
fees=1000;
}
void display(float C) //Function 2
{
cout<<StreamCode<<": "<<Streamname<<": "<<fees<<endl;
}
~Stream() //Function 3
{
cout<<"End of Stream Object"<<endl;
}
Stream (int SC, char S[] ,float F) : //Function 4
{
}
```

i) In Object Oriented Programming, what are Function 1 and Function 4 combined together referred as? Write the definition of function =

ii) What is the difference between the following statements?

Stream S1("Science",8700);

Stream S=Stream("Science",8700);

(b) Define a class CABS in C++ with the following specification:

[4]

**Data Members**

- CNo - to store Cab No
- Type - to store a character 'A', 'B' or 'C' as City Type
- PKM - to store per Kilo Meter charges
- Dist - to store Distance travelled (in KM)

**Member Functions**

- A constructor function to initialize Type as 'A' and CNo as '1111'
- A function to assign PKM as per the following table:

Type	Pkm
A	25
B	20
C	15

- A function Register() to allow administrator to enter the values for CNo and Type. Also, this function should call Charges() to assign PKM Charges.
- A function ShowCab() to allow user to enter the value of Distance and display CNo, Type, PKM, PKM\*Distance (as Amount) on screen.

(c) Consider the following C++ code and answer the questions from (i) to (iv) :

[4]

```

class University
{
long Id;
char City[20];
protected:
char Country[20];
public:
University();
void Register( );
void Display( );
};
class Department: private University
{
longDCode[10];
char HOD[20];
protected:
double Budget;
public:
Department();
void Enter();
void Show();
};
class Student: public Department
{
longRollNo;
char Name[20];
public:
Student();
void Enroll();
void View();
};

```

- (i) Which type of Inheritance is shown in the above example ?
- (ii) Write the names of those member functions, which are directly accessed from the objects of class Student.
- (iii) Write the names of those data members, which can be directly accessible from the member functions of class Student.
- (iv) Is it possible to directly call function Display( ) of class University from an object of class Department ?

2. a) Answer the questions (i) and (ii) after going through the following program:

[2]

```

#include<iostream.h>
#include<string.h>
classAirIndia
{
charfno[20];
intNop;
public:
AirIndia() //function1

;
strcpy(fno,"");
Nop=0;
;
AirIndia( char *str,int n) //function2
{
strcpy(fno,str);

```

```

Nop=n;
|
void input( ) //function3
|
cin>>fno;
cin>>Nop;
|
~AirIndia() //function4
|
cout<<"counter closed"<<endl;
| };

```

- (i) In Object Oriented Programming, which concept is illustrated by Function1 and Function2 together? Write the statement to call these functions.
- (ii) What is the scope of two data members of the class AirIndia? What does the scope of data members depend upon?

(b) Define a class WORKER with the following specification :

[4]

**Private members** of class WORKER:

- wno integer
- wname 25 characters
- hrwrk, wgrate float (hours worked and wage rate per hour)
- ~~totwage float (hrwrk \* wgrate)~~
- calcwg () A function to find hrwrk \* wgrate with float return type.

**Public members** of class WORKER

- in\_data () a function to accept values for wno, wname, hrwrk, wgrate and invoke
- calcwg() function to calculate totwage.
- out\_data () a function to display all the data members on the screen. You should give definitions of functions.

(c) Answer the questions (i) to (iv) based on the following:

[4]

```

class Chairperson
|
long CID; //Chairperson Identification Number
charCName[20];
protected:
char Description [40];
void Allocate();
public:
Chairperson();
void Assign();
void Show();
};
class Director
|
int DID; //Director ID
char Dname[20];
protected:
char Profile[30];
public:
Director();
void Input();
void output();
};

```

```

class Company: private Chairperson, public Director
{
int CID; //Company ID
char City[20], Country[20];
public:
Company();
void Enter();
void Display();
};

```

- (i) Which type of inheritance out of the following is specifically illustrated in the above C++ code?
- Single Level Inheritance
  - Multi Level Inheritance
  - Multiple Inheritance
- (ii) Write the names of data members, which are accessible by objects of class type Company.
- (iii) Write the names of all member functions, which are accessible by objects of class type Company.
- (iv) Write the names of all members, which are accessible from member functions of class Director.

3.(a) Write a C++ program, which reads one line at a time from the disk file TEST.TXT, and displays it to a monitor. Your program has to read all the contents of the file. Assume the length of the line not to exceed 80 characters. You have to include all the header files if required. [2]

(b) Observe the program segment given below carefully, and answer the question that follows: [1]

```

class PracFile
{
intPracno;
charPracName[20];
intTimeTaken;
int Marks;
public:

// function to enter PracFile details

voidEnterPrac();

// function to display PracFile details

voidShowPrac();

// function to return TimeTaken

intRTime() {return TimeTaken;}

// function to assign Marks

voidAssignmarks (int M)
{ Marks = M;}
};

voidAllocateMarks( )
{
fstream File;
File.open("MARKS.DAT",ios::binary|ios::in|ios::out);
PracFile P;
int Record = 0;
while (File.read(( char* ) &P, sizeof(P)))
{

```

```

if(P.RTime(>50)
P.Assignmarks(0)
else
P.Assignmarks(10)
_____ //statement 1
_____ //statement 2
Record ++ ;
}
File.close();
;

```

If the function AllocateMarks () is supposed to Allocate Marks for the records in the file MARKS.DAT based on their value of the member TimeTaken. Write C++ statements for the **statement 1** and **statement 2**, where, **statement 1** is required to position the file write pointer to an appropriate place in the file and **statement 2** is to perform the write operation with the modified record.

(c) Write a function in C++ to read and display the detail of all the users whose status is 'A' (i.e. Active) from a binary file "USER.DAT". Assuming the binary file "USER.DAT" is containing objects of class USER, which is defined as follows:

[3]

```

class USER
{
intUid; // User Id
charUname[20]; // User Name
char Status; // User Type: A Active I Inactive
public:
void Register (); // Function to enter the content
void show (); // Function to display all data members
charGetstatus ()
{
return Status;
}
};

```

4.(a) Observe the program segment given below carefully and fill the blanks marked as Line 1 and Line 2 using fstream functions for performing the required task. [1]

```

#include <fstream.h>
class Stock
{
longIno; // Item Number
char Item[20]; // Item Name
intQty; // Quantity
public:
void Get(int);
Get(int); // Function to enter the content
void Show (); // Function to display the content
void Purchase(intQty)
{
Qty+ = Qty; // Function to increment in Qty
}
longKnowIno ( )
{ returnIno; }
};
voidPurchaseitem(long PINo, intPQty)
// PINo -> Info of the item purchased
// PQty -> Number of items purchased

```

```

;
fstream file;
File.open("ITEMS.DAT".ios::binary|ios::in|ios::cut);
int Pos=-1;
Stock S;
while (Pos== -1 &&File.read((char*)&S, sizeof(S)))
if (S.KnowIno( ) == PINo)
;
S.Purchase(PQty); // To update the number of items
Pos = File.tellg()- sizeof(S);
//Line 1 : To place the file pointer to the required position
;
//Line 2 : To write the objects on the binary file
;
}
if (Pos == -1)
cout<<"No updation done as required Ino not found...";
File.close( );
;

```

(b) Write a function COUNT\_DO( ) in C++ to count the presence of a word "do" in a text file "MEMO.TXT". (2)

(c) Write a function in C++ to display object from the binary file "PRODUCT.Dat" whose product price is more than Rs 200.

Assuming that binary file is containing the objects of the following class:

(3)

```
class PRODUCT
```

```
int PRODUCT_no;
```

```
char PRODUCT_name[20];
```

```
float PRODUCT_price;
```

```
public:
```

```
void enter( )
```

```
{
```

```
cin>> PRODUCT_no ; gets(PRODUCT_name) ;
```

```
cin >> PRODUCT_price;
```

```
}
```

```
void display()
```

```
{
```

```
cout<< PRODUCT_no ; cout<<PRODUCT_name ;cout<< PRODUCT_price;
```

```
}
```

```
int ret_Price( )
```

```
{
```

```
return PRODUCT_price;
```

```
}
```

```
};
```

5.(a) An array MAT[10][11] is stored in the memory column wise with each element occupying 4 bytes of memory. Find out the base address and the address of element MAT[5][10], if the location of MAT[1][4] is stored at the address 2000. (3)

(b) Give the necessary declaration of a linked list implementation queue containing integer type elements. Also write a user defined function in C++ to delete an integer type number from the queue. (3)

(c) Evaluate the following postfix expression using a stack and show the contents of the stack after each operation. 100, 40, 8, +, 20, 10, -, +, \* (2)

