

- CalDen() //A member function to calculate Density as PopDens/Area

### Public Members

- Enter() //A function to allow user to enter values of Mcode,MName,MPop,Area and call CalDe  
// function

- ViewALL()//A function to display all the data members also display a message "Highly Populated  
//Area"if the Density is more than 12000

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

4

```
class AC
{
    char Model[10];
    char Date_of_purchase[10];
    char Company[20];
public:
    AC();
    void entercardetail();
    void showcardetail();
};
class Accessories : protected AC
{
protected:
    char Stabilizer[30];
    char AC_cover[20];
public:
    float Price;
    Accessories();
    void enteraccessoriesdetails();
    void showaccessoriesdetails();
};
class Dealer : public Accessories
{
    int No_of_dealers;
    char dealers_name[20];
    int No_of_products;
public:
    Dealer();
    void enterdetails();
    void showdetails();
};
```

- How many bytes will be required by an object of class Dealer and class Accessories?
- Which type of inheritance is illustrated in the above c++ code? Write the base class and derived class name of class Accessories.
- Write names of all the members which are accessible from the objects of class Dealer.
- Write names of all the members accessible from member functions of class Dealer.

3. a) Consider the following structure:

3

```
struct Employee
{ int ECode;
  char Ename[20]; };
```

Write a function to accept an Employee array and perform insertion sort in the increasing order of ECode.

- b) 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

**Bluebells School International**  
**First Term Examination, August 2016**  
**Class XII-A**

**Code No. 91/1**

- Please check that this question paper contains 6 questions and 7 printed pages.
- Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Marks will be deducted for not maintaining serial order and untidy work.
- Please write down the Serial Number of the question before attempting it.
- 15 minutes time has been allotted to read this question paper. The question paper will be distributed at 8.00a.m. From 8.00a.m. to 8.15a.m. the student will read the question paper only and will not write any answer on the answer script during this period.

**COMPUTER SCIENCE**

Time allowed : 3 hours

Maximum Marks : 70

**Instructions :** (i) *All questions are compulsory.*

(ii) *Programming Language : C++*

1. a) When a function is overloaded, there are multiple definitions of the functions. What makes the various definitions of the function different from each other? 2
- b) Observe the following program very carefully and write the names of those header file(s), which are essentially needed to compile and execute the following program successfully : 1

```
typedef char STRING[80];
void main()
{
    STRING Txt[] = "We love Peace";
    int Count=0;
    while (Txt[Count]!='\0')
        if (isalpha(Txt[Count]))
            Txt[Count++]='@';
        else
            Txt[Count++]='#';
    puts(Txt);
}
```

- c) Rewrite the following C++ program after removing all the syntactical errors (if any), underlining each correction. : 2

```
include<iostream.h>
#define PI=3.14
void main( )
{
    float r;a;
    cout<<"enter any radius";
    cin>>r;
    a=PI*pow(r,2);
    cout<<"Area"<<a
}
```



d) Find the output of the following program.

```
#include<iostream.h>
#include<ctype.h>
#include<string.h>
void string_func (char* str)
{
    int i, j, len=strlen (str);
    for (i =0; i< len; i++)
    {
        for( j=0; j<=i; j++)
            cout<<str[i];
        cout<<endl;
    }
}

void main ( )
{
    string_func("CALIFORNIA");
}
```

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.

```
typedef char STRING[80];
void MIXNOW(STRING S)
{
    int Size=strlen(S);
    for (int I=0;I<Size-1;I+=2)
    {
        char WS=S[I];
        S[I]=S[I+1];
        S[I+1]=WS;
    }
    for (I=1;I<Size;I+=2)
        if (S[I]>='M' && S[I]<='U')
            S[I]='@';
}

void main()
{
    STRING Word="BACKABACK";

    MIXNOW(Word);
    cout<<Word<<endl;
}
```

Observe the following C++ code and find out, which out of the given options i) to iv) are the expected correct output. Also assign the maximum and minimum value that can be assigned to the variable 'Go'. 2, 3

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

i. 100\$\$75 ii. 75\$\$10\$\$125\$\$ iii. 75\$\$10\$\$ iv. 10\$\$125\$

g) What are Nested Structures? Give an example. 2

h) Differentiate between Call by value and Call by reference. 2

2. a) What is copy constructor and parameterized constructor? Illustrate with an example. 2

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

```
class Stream {
    int StreamCode;
    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 4.

ii. What is the difference between the following statements? Stream S(11, "Science", 8700); Stream S=Stream(11, "Science", 8700);

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

#### Private Members

- Mcode //Data member for Code (an integer)
- MName //Data member for Name (a string)
- MPop //Data member for Population (a long int)
- Area //Data member for Area Coverage (a float)
- PopDens //Data member for Population Density (a float)

Write a function REVROW(int P[ ][5],int N,int M) in C++ to display the content of a two dimensional array, with each row content in reverse order.

For example, if the content of array is as follows :

15	12	56	45	51
13	91	92	87	63
11	23	61	46	81

The function should display output as

```
51 45 56 12 15
63 87 92 91 13
81 46 61 23 81
```

4. a) Observe the program segment given below carefully & fill the blanks marked statement1 and statement2. 1

```
class PracFile
{
    int Pracno;
    char PracName[20];
    int TimeTaken;
    int Marks;
public:
    void EnterPrac( ),           // function to enter PracFile details
    void ShowPrac( );           // function to display PracFile details
    int RTime( )                // function to return TimeTaken
    { return TimeTaken; }
    void Assignmarks (int M) // function to assign Marks
    { Marks = M; }
};

void AllocateMarks( )
{
    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.



b) Write a function Rev ext() to read a text file " Input.txt " and Print only word starting with

order. Example: If value in text file is: INDIA IS MY COUNTRY

Output will be: AIDNI SI MY COUNTRY

c)

```
void main( )
{   char='A';
    fstream fileout("data.dat",ios::out);
    fileout<<ch;
    int p = fileout.tellg( );
    cout<<p;
}
```

What is the output if the file content before the execution of the program is the string "ABC"

(Note that "are not part of the file)

1

d) Write a function in C++ to search and display details, whose destination is "Chandigarh" from binary file "Flight.Dat". Assuming the binary file is containing the objects of the following class:

3

```
class FLIGHT
{
    int Fno;           // Flight Number
    char From[20];     // Flight Starting Point
    char To[20];       // Flight Destination

public:
    char * GetFrom ( ); { return from; }
    char * GetTo( );   { return To; }
    void input()        { cin>>Fno>>; gets(From); get(To); }
    void show( )        { cout<<Fno<< " " <<From << " " <<To<<endl; }
};
```

5. (a) What do you understand by the terms

i. Alternate key ii. Degree of a relation iii. Distinct

3

(b) What do you understand by the Union and Cartesian Product operations performed upon two relations?

2

(c) Consider the following tables EMPLOYEES and EMPSALARY. Write SQL commands for the statements(i) to (iv) and give outputs for SQL queries (v) to (viii).

6

- (i) To display Firstname, Lastname, address and city of all employees leaving in Paris from the table EMPLOYEES.
- (ii) To display the content of EMPLOYEES table in descending order of Firstname.
- (iii) To display the Firstname, Lastname, and total salary of all Managers from the tables EMPLOYEES and EMPSALARY, where total salary is calculated as SALARY + BENEFITS
- (iv) To display the maximum salary among Managers and Clerks from the table EMPSALARY.
- (v) SELECT FIRTNAME,SALARY FROM EMPLOYEES, EMPSALARY WHERE DESIGNATION ='Salesman' AND EMPLOYEES.EMPID =EMPSALARY.EMPID;
- (vi) SELECT COUNT(DISTINCT DESIGNATION) FROM EMPSALARY;

2) SELECT DESIGNATION,SUM(SALARY) FROM EMPSALARY GROUP BY DESIGNATION HAVING COUNT(\*)>2;

(viii) SELECT SUM(BENEFITS) FROM EMPLOYEES WHERE DESIGNATION='Clerk';

EMPLOYEES

EMPID	FIRSTNAME	LASTNAME	ADDRESS	CITY
010	George	Smith	83 First Street	Howard
105	Mary	Jones	842 Vine Ave	Loasantiville
152	Sam	Tones	33 Elm St	Paris
215	Sarah	Acherman	440 US 110	Upton
244	Manila	Sengupta	24 Friends Street	New Delhi
300	Robert	Samuel	9 Fifth Cross	Washington
335	Henry	Williams	12 Moore Street	Boston
400	Rachel	Lee	121 Harrison St	New York
441	Peter	Thompson	11 Red Road	Paris

EMPSALARY

EMPID	SALARY	BENEFITS	DESIGNATION
010	75000	15000	Manager
105	65000	15000	Manager
152	80000	25000	Director
215	75000	12500	Manager
244	50000	12000	Clerk
300	45000	10000	Clerk
335	40000	10000	Clerk
400	32000	7500	Salesman
441	28000	7500	Salesman

Handwritten calculations for sum of salaries for Clerks:  
 50000 + 45000 + 40000 = 135000  
 135000 + 12000 + 10000 = 157000

6. (a) Verify  $X' \cdot Y + X \cdot Y' = (X' + Y') \cdot (X + Y)$  algebraically.

(b) Draw the logic circuit for  $F = AB' + CD'$

(c) State the following laws:

i. Absorption Law ii. Distributive Law iii. Involution Law iv. Associative Law

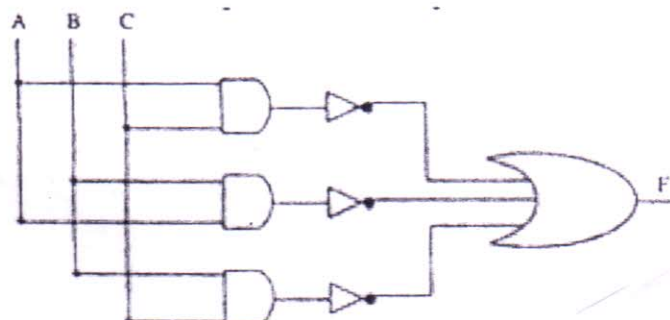
(d) Derive the POS form of Boolean expression from the given truth table.

A	B	C	F(A B C)
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

(e) Reduce the following Boolean expression using K map

$$F(M,N,O,P) = \Sigma(0,1,4,5,6,7,11,12,13,14,15)$$

(e) Write the equivalent expression for the following Logical Circuit:



Handwritten notes:  $3 \times 2 = 6$ ,  $6 \times 2 = 12$ ,  $12 \times 2 = 24$