BHARATIYA VIDYA BHAVAN'S V.M.PUBLIC SCHOOL, VADODARA
SAMPLE PAPER

Class : XII **Max Marks : 70**
Subject : Computer Science **Time Allotted : 3 hrs**

General Instructions :
Programming Language : **C++.**
All questions are compulsory

1.a). What is the benefit of using default parameter/argument in a function? Give a suitable example to illustrate it using C++ code. [2]

b) Name the header files required to execute the following program: [1]

```
void main()
{ float side,area;
cin>>area;
side=sqrt(area);
cout<<"one side of the square"<<side<<endl;
}
```

c) Rewrite the following program after removing syntactical error(s) if any. Underline each correction. Assume that all necessary header files are included. [2]

```
# define area(a,b)  a*b;
void main()
Float x,y,f;
cin>>x>>y;
F=area(x,y);
cout<<"area is"<<f<endline;
}
```

d) Find the Output of the following - Assume that all necessary header files are included [2]

```
void main()
{  char*text="BHAVANS";
   int *p,num[]={1,5,7,9};
   p=num;
   cout<<*p<<text<<endl;
   text++;
   p++;
   cout<<*p<<text<<endl;  }
```

(e) Find the output of the following program. [3]

```
#include<iostream.h>
void main()
{ int Numbers[]={2,4,8,10};
  int *ptr=Numbers;
  for(int c=0;c<4;c++)
 {(*ptr)*=2;
   --ptr ;  }
 for(int C=0;C<4;C++)
 cout<<Numbers[C]<<"#';
 cout<<endl ;  }
```

(f) Based on the following C++ code, find out the expected correct output(s) from the options (i) to (iv)Also find out the minimum and maximum value that can be assigned to the variable **guess** used in the code at the time when value of **turn** is 3. [2]

```
void main()
{ char result[ ][10]={"RED","BLUE","GREEN"};
int getit=9,guess;
for(int turn=1;turn<4;turn++)
{ guess=random(turn);
 cout<<getit-guess<<result[guess]<<"*";}
 }
```

(i) 9 RED*9RED*8BLUE*
(ii) 9RED*7GREEN*8RED*
(iii) 9RED*8BLUE*9RED*
(iv) 9RED*8BLUE*8RED*

Q2.(a)Write any two similarities between constructors and Destructors. Write the function headers for copy constructor and destructor of a class Vehicle. [2]

(b)Answer the question (i) and (ii) after going through the following class: [2]

```
class Contest
{ int regno , event ;
  public:
  Contest( );//function 1
  Contest(int rn);//function 2
  Contest(Contest &C); // function 3
  void register( );
  void Display( );
 };
```

i) Name the specific feature of class shown by function1 , function 2 and function 3 in the above example.

ii) Write C++ statement to call function 1.

(c) Define a class POLLS with the following specifications. [4]

Private members:
Data : candidate_name, party, vote_received
Public members:
Functions : enterdetails ( ) – to input data
Display ( ) – to display the details of the winner
Winner ( ) – To return the details of the winner through the object after comparing the votes received by two candidates.

(d) Consider the following declarations and answer the questions given below: [4]

```
class Personal
{ int Class,rno;
  char section;
  protected:
 char name[20];
 public:
 personal();
```

```
    void pentry();
    void pdisplay();
  };
  class marks:private personal
  { float M[5];
   protected:
  char grade[5];
  public:
  marks();
 void mentry();
 void mdisplay();
 };
class result : public marks
{ float total,agg;
public:
char finalgrade,comments[20];
result();
void rcalculate( );
void rdisplay( );
};
```

i) Which type of inheritance is shown in the above example?

ii) Write the names of those data members, which can be directly accessed from the objects of class result.

iii) Write the names of those member functions , which can be directly accessed from the objects of the class result.

iv) Write the names of those data members, which can be directly accessed from the Mentry() function of class marks.

Q3. (a) Write code for a function void changeover(int p[ ],int n)in C++,which re-positions all the elements of the array by shifting each of them to the next position and by shifting the last element to the first position. [2]

For example, if the content of the array is

10 20 30 40 50

The changed contents should be

50 10 20 30 40

(b) An array Array [15][10] is stored in the memory along the row with each element occupying 8 bytes. If the base address of the array is 14000, find out the location of Array[10][7]. [3]

(c)Write a function which accepts a 2D array of integers and its size as its arguments and displays the elements which lie on the upper half triangle . [Assuming the 2D array to be a square matrix with dimensions i.e. 3x3, 4x4 ….. etc]; [3]

For example : for a 3x3 matrix

1 2 3

4 5 6

7 8 9

The output should be:

1 2 3

5 6

9

(d) Evaluate the following postfix expression(Show the status of stack after execution of each operation) [2]

5 , 2 , * , 50 , 5 , / , 5 , - , +

(e) Write a function to insert a node containing Book's information into a dynamically allocated circular queue implemented with the help of the following structure [4]

```
struct Book
{ int bno;
  char Bname[20];
  Book *next; };
```

4. a) Fill in the blanks marked as Statement1 and Statement2 in the program segment given below with appropriate function for the required task. [1]

```
class Club
 { long int Mno; //member number
   char Mname[20];  //Member Name
   char Email[30]; // Email of  member
   public:
   void register( ); //function to register member
   void disp(); // function to display detils
   void Changeemail() // function to change email
   { cout<<"Enter changed email";
     cin>>Email;
   }
   long int getmno( ){ return Mno;}
 };
  void Modifydata( )
  { fstream file;
    file.open("club.dat",ios::binary|ios::in|ios::out);
    int modify=0,position;
    long int modimno;
   cout<<"mno-whose email is to be modified";
cin>>modimno;
club cl;
while(!modify && file.read((char*)&cl,sizeof(cl)));
{ if(cl.getmno( ) =modimno)
{ cl.Changeemail();
   position=file.tellg()-sizeof(cl);
//   statement 1: to place file pointer to the required position
   _____
//  statement 2: to write the object cl on to the binary file
  _____
modify++;}
}
if(modify)
cout<<"email changed……"<<endl;
else
```

```
cout<<"member not found….."<<endl;
file.close();}
```

b) Write a user defined function CountIsAre( ) in C++ to read the content from a text file "Mybook.txt", and count the word "is" and "are" (not case sensitive) present in the file. [2]

c) Following is the structure of each record in a data file named "PRODUCT.DAT".

```
struct PRODUCT
{       char Product_Code[10];
        int price, Stock;
};
```

Write a function in C++ to update the file with a new value of Stock. The Stock and the Product Code, whose Stock to be updated, are read during the execution of the program. [3]

5 (a) Explain the concept of candidate keys with the help of an appropriate example. [2]

(b)Consider the following tables ACTIVITY and COACH. Write SQL commands for the statements (i) to (vi) and give outputs for SQL queries (vii) to (x) [6]

Table: SPORTS

SCode	SportsName	ParticipantsNum	PrizeMoney	ScheduleDate
1001	Relay 100x4	16	10000	23-Jan-2013
1002	High jump	10	12000	12-Dec-2012
1003	Shot Put	12	8000	14-Feb-2012
1005	Long Jump	12	9000	01-Jan-2011
1008	Discuss Throw	10	15000	19-Mar-2013

Table: COACH

PCode	Name	SCode
1	Ahmad Hussain	1001
2	Ravinder	1008
3	Janila	1001
4	Naaz	1003

(i) To display the name of all sports with their Scodes in descending order.

(ii) To display the coach's name and SCodes in ascending order of SCode from the table COACH

(iii) To increase the prize money by 1000 for the sport Long Jump.

(iv) To display the content of the SPORTS table whose ScheduleDate is earlier than 01/01/2013 in ascending order of ParticipantNum.

(v) SELECT COUNT(DISTINCT ParticipantsNum) FROM SPORTS;

(vi)SELECT MAX(ScheduleDate),MIN(ScheduleDate) FROM SPORTS;

(vii)SELECT SUM(PrizeMoney) FROM SPORTS;

(viii)SELECT DISTINCT ParticipantNum FROM SPORTS;

6. (a)State and verify Demorgan's Laws algebraically. [2]

(b) Prove X+Z=X+X'.Z+Y.Z USING Boolean laws [2]

(c) Convert the following Boolean expression into its equivalent Canonical Sum of product expression [1]

(X'+Y+Z').(X'+Y+Z).(X'+Y'+Z).(X'+Y'+Z')

(d) Reduce the following Boolean Expression using K-Map: [3]

$F(A,B,C,D)=\Sigma(0,1,2,4,5,6,8,10)$

7. (a) Write two advantages of using an optical fibre over a coaxial cable to connect two service stations, which are 200 m away from each other. [1]

(b) Expand the following terminologies: [1]

(i) CDMA (ii) GSM

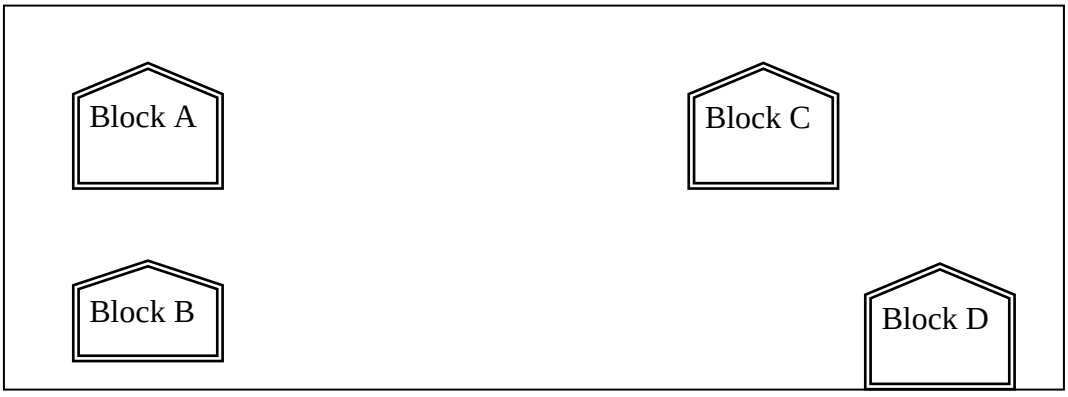
c) Give two major reasons to have network security. [1]

d) Differentiate between star and bus topology. [1]

e) What is worm?How it is removed? [1]

f) What is spam mail? [1]

g) ABC Petrochemicals has set up its new center at Mangalore for its office and web based activities. It has 4 blocks of buildings as shown in the diagram below:



Center to center distances between various blocks

Black A to Block B	50 m
Block B to Block C	150 m
Block C to Block D	25 m
Block A to Block D	170 m
Block B to Block D	125 m
Block A to Block C	90 m

Number of Computers

Black A	25
Block B	50
Block C	125
Block D	10

g1) Suggest a cable layout of connections between the blocks. [1]

g2) Suggest the most suitable place (i.e. block) to house the server of this organization with a suitable reason. [1]

g3) Suggest the placement of the following devices with justification [1]

i)Repeater

ii)Hub/Switch

g4) The organization is planning to link its front office situated in the city in a hilly region where cable connection is not feasible, suggest an economic way to connect it with reasonably high speed? [1]