COMMON PRE-BOARD EXAMINATION 2017-2018
COMPUTER SCIENCE

CLASS XII
Time Allowed: 3 Hours   **Maximum Marks: 70**

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

1.
   a. What is the difference between Global variable and Local variable?   **2**
   b. Write the names of the header files to which the following functions belong: **1**
      (1) strcmp()
      (2) fabs()
   c. Rewrite the following program after removing the syntactical errors (if any). Underline each correction.   **2**

```
#include[iostream.h]
class PAYITNOW
{
            int charge;
       PUBLIC:
            void Raise()    {cin>>charge; }
            oid show()      { cout<<charge;}
};
void main()
{
       PAYITNOW P;        P.Raise();      Show();
}
```

   d. Find the output of the following program: **3**

```
#include<iostream.h>
struct PLAY
{      int Score, Bonus;      };
void Calculate(PLAY &p, int N=10)
{
       P.Score++;    P.Bonus+=N;
}
void main()
{
       PLAY PL={10, 15};
       Calculate(PL,5);       cout<<PL.Score<<":"<<PL.Bonus<<endl;
       Calculate(PL);         cout<<PL.Score<<":"<<PL.Bonus<<endl;
       Calculate(PL,15);      cout<<PL.Score<<":"<<PL.Bonus<<endl;
}
```

   e. Find the output of the following program: **2**

```
#include<iostream.h>
#include<ctype.h>
```

```
        void Encrypt(char T[])
        {
                for(int i=0; T[i]!='\0'; i+=2)
                        if(T[i]=='A' || T[i]=='E')
                                T[i]='#';
                        else if(islower(T[i]))
                                T[i]=toupper(T[i]);
                        else
                                T[i]='@';
        }
        void main()
        {
                char Text[]="SaVE EArtH";
                Encrypt(Text);
                cout<<Text<<endl;
        }
```

f. In the following program, if the value of N given by the user is 15, what maximum and minimum values the program could possibly display? **2**

```
        #include<iostream.h>
        #include<stdlib.h>
        void main()
        {
                int N, Guessme;
                randomize();
                cin>>n;
                Guessme=random(N)+10;
                cout<<Guessme<<endl;
        }
```

2.

a. What do you understand by Data Encapsulation and Data Hiding? **2**

b. Answer the questions (1) and (2) after going through the following class: **2**

```
        class Seminar
        {
                int Time;
                public:
                        Seminar()                                   //Function1
                        {
                                Time=30;
                                cout<<"Seminar starts now"<<endl;
                        }
                        void Lecture()                              //Function2
                        {
                                cout<<"Lectures in the seminar on"<<endl;
                        }
                        Seminar(int Duration)                       //Function3
                        {
                                Time=Duration;
                                cout<<"Seminar starts now"<<endl;
```

```
                    }
                    ~Seminar()                                    //Function4
                    {
                            cout<<"Vote of thanks"<<endl;
                    }
        };
```

(1) In Object Oriented Programming, what is Function4 referred to as and when does it get invoked / called?
(2) In Object Oriented Programming, which concept is illustrated by Function1 and Function3 together? Write an example illustrating the calls for these functions.

c. Define a class TEST in C++ with following description: **4**

Private members:
(1) TestCode of type integer.
(2) Description of type string.
(3) NoCandidate of type integer.
(4) CenterReqd of type integer.
(5) A member function CALCNTR() to calculate and return the number of centers as (NoCandidate/100 + 1)

Public members:
(1) A function SCHEDULE() to allow user to enter values for TestCode, Description, NoCandidate, and call function CALCNTR() to calculate the number of centers.
(2) A function DISPTEST() to allow user to view the content of all the data members.

d. Answer the questions (1) to (4) based on the following: **4**

```
        class PUBLISHER
        {
                        char Pub[12];
                        double Turnover;
                protected:
                        void Register();
                public:
                        PUBLISHER();
                        void Enter();
                        void Display();
        };
        class BRANCH
        {
                        char City[20];
                protected:
                        float Employees;
                public:
                        BRANCH();
                        void Haveit();
                        void Giveit();
        };
        class AUTHOR: private BRANCH, public PUBLISHER
        {
                        int Acode;
```

3

```
                    char Aname[20];
                    float Amount;
            public:
                    AUTHOR();
                    void Start();
                    void Show();
        };
```

(1) Write the names of data members, which are accessible from objects belonging to class AUTHOR.
(2) Write the names of all the member functions which are accessible from objects belonging to class BRANCH.
(3) Write the names of all the members which are accessible from member functions of class AUTHOR.
(4) How many bytes will be required by an object belonging to class AUTHOR?

3.
  a. Write a function in C++, which accepts an integer array and its size as parameters and rearranges the array in reverse. **3**
  b. An array S[40][30] is stored in the memory along the row with each of the element occupying 2 bytes, find out the memory location for the element S[15][5], if an element S[20][10] is stored at the memory location 5500. **3**
  c. Write a function in C++ to perform insert operation in dynamically allocated Queue containing names of students. **4**

```
        struct Node
        {
                Char Name[20];
                Node *Next;
        };

        class Queue
        {
                Node *Rear, *Front;
        public:
                void Insert();
                void Delete();
        };
```

  d. Write a function in C++ to find the sum of both left and right diagonal elements from a two dimensional array(matrix). **2**
  e. Evaluate the following postfix notation of expression: **20, 30, +, 50, 40, -, *** **2**

4.
  a. Observe the program segment given below carefully and fill in the blanks marked as Statement1 and Statement2 using seekp() and seekg() functions for performing the required task. **1**

```
        #include<fstream.h>
        class Item
        {
                int ino;char Item[20];
        public:
```

```cpp
                void Search();
                void Modify(int);
        };
        void Item::Search(int RecNo)
        {
                fstream File;
                File.open("Stock.DAT", ios::binary|ios::in);
                _____          Statement1
                File,read((char *)this, sizeof(Item);
                cout<<ino<<"➜";
                File.close();
        }
        void Item::Modify(int RecNo)
        {
                fstream File;
                File.open("Stock.DAT", ios::binary|ios::in|ios::out);
                cin>>ino;
                cin.getline(Item,20);
                _____          Statement2
                File,write((char *)this, sizeof(Item);
                File.close();
        }
```

b. Write a function in C++ to count the number of lines present in a text file "STORY.TXT". **2**

c. Write a function in C++ to search for a BookNo from a binary file "Book.DAT", assuming the binary file is containing the objects of the following class. **3**

```cpp
        class Book
        {
                int Bno;        char Title[20];
        public:
                int RBno()
                {       return Bno;    }
                void Enter()
                {       cin>>Bno;       gets(Title);    }
                void Display()
                {       cout<<Bno<<Title<<endl;    }
        };
```

5.
   a. What do you understand by Degree and Cardinality of a table? **2**
   b. Consider the following tables **Activity** and **Coach**. Write SQL commands for the statements (1) to (4) and give output for SQL queries (5) to (8). **6**

Activity

ACode	ActivityName	ParticipantsNum	PrizeMoney	ScheduleDate
1001	Relay 100 * 4	16	10000	23-Jan-2004
1002	High Jump	10	12000	12-Dec-2003
1003	Shot Put	12	8000	14-Feb-2004
1004	Long Jump	12	9000	01-Jan-2004
1005	Discuss Throw	10	15000	19-Mar-2004

Coach

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

(1) To display the name of all activities with their Acodes in descending order.
(2) To display sum of PrizeMoney for each of the number of ParticipantNum.
(3) To display the coach's name and Acodes in ascending order of Acode from the table Coach.
(4) To display the content of the Activity table whose Schedule date earlier than 01-Jan-2004 in ascending order of ParticipantsNum.
(5) select count(distinct ParticipantsNum) from Activity;
(6) select max(ScheduleDate), min(ScheduleDate) from Activity;
(7) select sum(PrizeMoney) from Activity;
(8) select distinct ParticipantNum from Coach;

6.
   a. State and verify Demorgan's laws. **2**
   b. Draw a logical circuit diagram for the following Boolean Expression: **2**
      A . (B + C')
   c. Write the POS form of a Boolean function F, which is represented in a truth table as follows: **1**

U	V	W	F
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

   d. Reduce the following Boolean Expression using K-Map: **3**
      F(A,B,C,D) = $\sum$(0,1,2,4,5,6,8,10)

7.
   a. What is the significance of ARPANET in the network? **1**
   b. Expand the following terminologies: **1**
      (1) CDMA
      (2) GSM
   c. Give two major reasons to have network security. **1**
   d. What is the purpose of using a web Browser? Name any one commonly used Web Browser. **1**
   e. Define the term Bandwidth. Give unit of Bandwidth. **1**
   f. What is the importance of URL in networking? **1**
   g. Ravya Industries has set up its new center at Kaka Nagar for its office and web based activities. The company compound has 4 buildings as shown in the diagram below:
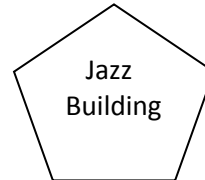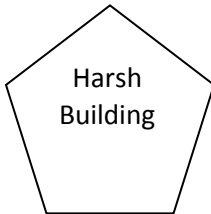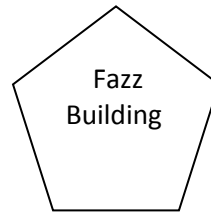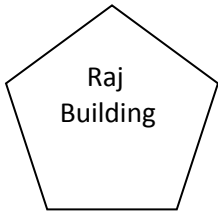
Center to center distances between various buildings is as follows:

Harsh Building to Raj Building	50m
Raj Building to Fazz Building	60m
Fazz Building to Jazz Building	25m
Jazz Building to Harsh Building	170m
Harsh Building to Fazz Building	125m
Raj Building to Jazz Building	90m

Number of computers in each of the buildings is as follows:

Harsh Building	15
Raj Building	150
Fazz Building	15
Jazz Building	25

(1) Suggest a cable layout of connections between the buildings.   **1**
(2) Suggest the most suitable place to house the server of this organization with a suitable
     reason.   **1**
(3) Suggest the placement of the following devices with justification: **1**
       (a) Modem
       (b) Switch
(4) The organization is planning to link its sale counter situated in various parts of the same city.
     Which type of network out of LAN, MAN, WAN will be formed? Justify your answer. **1**