# SECOND PREBOARD EXAMINATION (2017–18)
## CLASS: XII

**Subject: COMPUTER SCIENCE**          **Date: 24.1.2018**

Time Allowed: 3 Hours                    Maximum Marks: 70

General instructions:

(1)    **All** questions are **compulsory**.

(2)    Marks are indicated against each question.

(3)    Please check that this question paper contains 10 printed pages only.

(4)    Please check that this question paper contains 7 questions.

1. a) Find the correct identifiers out of the following, which can be 2 used for naming Variable, Constants or Functions in a C++ program:

   For, while, INT, NeW, delete, 1stName, Add+Subtract, name1

   b) Write the names of the header files, which is/are essentially 1 required to run/execute the following c++ code:

```cpp
void main()
{       char C, String [] = "Excellence
Overload";     for (int I=0; String [I]!='\0';
I++)    if (String [I] == ' ')
   cout<<endl;
   else
      {
         C=toupper(String[I]);
   cout<<C ;
      }
}
```

   c)    What will be the output of the following program:                    2

```cpp
#include<iostream.h>
#include<conio.h>
#include<ctype.h> #include<string.h>
void ChangeString(char Text[],int &Counter)
{
   char *Ptr=Text;        int
Length=strlen(Text);
      for(;Counter<Length- 2; Counter+=2,Ptr++)
      {
```

```
                *(Ptr+Counter)=toupper(*(Ptr+Counter));
        }
    }
    void main()
    {
        clrscr();        int Position=0;
        char Message[]="Pointers Fun";
        ChangeString(Message,Position);
        cout<<Message<<"@"<<Position;
    }
```

d) Observe the following program and find out, which output(s) out of (i) to (iv) will **not** be expected from the program? Give suitable reason. What will be the minimum and the maximum value assigned to the variable Chance ?      2

```
#include<iostream.h>
#include<stdlib.h> void
main()
{
    randomize();    int Arr[]
={9,6},N;    int
Chance=random(2)+10;
    for(int C=0;C<2;C++)
    {
        N=random(2);
        cout<<Arr[N]+Chance<<"#";
    }
}
```

(i)  9#6#

(ii) 19#17#

(iii) 19#16#

(iv) 20#16#

2. a)    Explain data hiding with an example.                          2

b) Find and write the output of the following C++ program 2 code: **Note:** Assume all required header files are already being included in the program.

```
#include<iostream.h> class
Share
{
```

```cpp
        long int Code;
        float Rate;
        int DD;
        public:
                Share(){Code=1000;Rate=100;DD=1;}
                void GetCode(long int C,float R)
                {
                        Code=C;
                        Rate=R;
                }
                void Update(int Change,int D)
                {
                        Rate+=Change;
                        DD=D;
                }
                void Status()
                {
                        cout<<"Date:"<<DD<<endl;
                        cout<<Code<<"#"<<Rate<<endl;
                }
        };
        void main( )
        {
            Share S,T,U;
            S.GetCode(1324,350);
            T.GetCode(1435,250);
            S.Update(50,28);
            U.Update(25,26);
          S.Status();
          T.Status();
            U.Status();
        }
```

c)   Answer the following questions (i) and (ii) after going    2   through the following class.

```cpp
class Interview
{
   int Month;
   public:
      Interview(int y) {Month=y;}//constructor 1
      Interview(Interview &t); //constructor 2
};
```

(i) Create an object, such that it invokes Constructor 1. (ii) Write complete definition for Constructer 2.

d)   Define a class Flight in C++ with following description:    4

**Private Members**

- A data member Flight number of type integer
- A data member Destination of type string
- A data member Distance of type float
- A data member Fuel of type float
- A member function CALFUEL() to calculate the value of Fuel as per the following criteria

| Distance | Fuel |
|---|---|
| <=1000 | 500 |
| more than 1000 and <=2000 | 1100 |
| more than 2000 | 2200 |

**Public Members**

- A function FEEDINFO() to allow user to enter values for Flight Number, Destination, Distance & call function CALFUEL() to calculate the quantity of Fuel
- A function SHOWINFO() to allow user to view the content of all the data members

e) Define Multilevel and Multiple inheritance in context of 2 Object Oriented Programming with a suitable example.

f) Answer the questions (i) to(iv) based on the following code:      4

```
class Drug
{
    char Category[10];    char
Date_of_manufacture[10];      char
Company[20];       public:
           Drug();
           void enterdrugdetails();
           void showdrugdetails();
};
class Tablet:public Drug
{
```

```
    protected:              char
tablet_name[30];         char
volume_lable[20];  public:
        float Price;
    Tablet();
            void entertabletdetails();
            void showtabletdetails();
};
class PainReliever:public Tablet
{
    int Dosage_units;      char
side_effects[20];  int
Use_within_days;   public:
    PainReliever();
    void enterdetails();
            void showdetails();
};
```

(i) How many bytes will be required by an object of class Drug and an object of class PainReliever respectively?  (ii) Write the names of all the member functions accessible from the object of class PainReliever.

(iii)Write the names of all the members accessible from member functions of class Tablet.

 (iv)Write names of all the data members which are accessible from objects of class PainReliever.

3. a) Observe the program segment given below carefully and fill 2 the blanks marked as Statement 1 and Statement 2 using tellg() and seekp() functions for performing the required task.

```
#include <fstream.h> class
Client
{
    long Cno;
    charName[20],Email[30] ;
    public: //Function to allow user to enter the Cno,
Name,Email
        void Enter() ; //Function to allow user to enter
(modify) Email
            void Modify() ;
            long ReturnCno()
            {
                return Cno;
            }
};
```

```
void ChangeEmail()
{
   Client C;
   fstream F;
      F.open("INFO.DAT",ios::binary | ios::in | ios::out);
      long Cnoc; //Client's no. whose Email needs to be changed
      cin>>Cnoc;
      while (F.read((char*)&C, sizeof(C)))
      {
            if (Cnoc= =C.ReturnCno())
            {
                  C.Modify();
                  int Pos = _____  //Statement 1
               //To find the current position of file pointer
         _____ // Statement 2 //To move the
//file pointer to write the modified record back onto the file for //the
desired Cnoc
                  F.write((char*)&C, sizeof(C));
            }
      }
      F.close();
}
```

b)  Write the function AECount( ) in C++, which should read 2 character
    of a text file NOTES.txt, should count and display the occurrence of
    alphabets A and E (including small case a and e too).
    *Example:* If the file content is as follows:

    CBSE enhanced its CCE
    guidelines further.

    The AECount( ) function should display the output as A:1
    E:7

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

```
class BOOK
{
   int Bno;    char
Title[20];
   public:
            int RBno()
            {
```

```
                    return Bno;
            }
            void Enter()
            {
                    cin>>Bno;gets(Title);
            }
            void Display()
            {
                    cout<<Bno<<Title<<endl;
            }
    };
```
4.  a)   Evaluate the following postfix notation of expression:   2
    (Show status of Stack after each operation)
    True, False, NOT, OR, False, True, OR, AND

 b)  Write a function in C++ to perform Insert operation in 3 dynamically
     allocated Queue containing names of students.

```
    Struct NODE
    {
            char Name[20];
            NODE *Link;
    };
```
 c)  Given an array: 70,10,31,56,20,64,48. Sort this      3
     array using Selection sort and Bubble sort.
 d)  Define a function SWAPROW() in C++ to swap (interchange) 3 the
     first row elements with the last row argument of the function.


     Example: If the two dimensional array contains

| 2 | 1 | 4 | 9 |
|---|---|---|---|
| 1 | 3 | 7 | 7 |
| 5 | 8 | 6 | 3 |
| 7 | 2 | 1 | 2 |

After swapping the content of the first and last row should be like:

| 7 | 2 | 1 | 2 |
|---|---|---|---|
| 1 | 3 | 7 | 7 |
| 5 | 8 | 6 | 3 |
| 2 | 1 | 4 | 9 |

e) An array T [20][10] is stored in the memory along the column 3 with each of the elements occupying 2 bytes. Find out the memory location of T[10][5], if the element T[2][9] is stored at the location 7600.

5. a) Observe the table 'Club' given below: 2

| Member_id | Member_Name | Address | Age | Fee | **Club** |
|-----------|-------------|---------|-----|------|----|
| M001 | Sumit | Delhi | 20 | 2000 | |
| M002 | Nisha | Gurgaon | 19 | 3500 | |
| M003 | Nisar | Delhi | 21 | 2100 | |
| M004 | Sachin | Chennai | 18 | 3500 | |

i. What is the cardinality and degree of the above given table?

ii. Write the names of the most appropriate columns, which can be considered the primary key.

b) Write SQL queries for (i) to (iv) and find outputs for SQL 6 queries (v) to (viii), which are based on the tables.

TABLE : BOOKS

| BOOK_ID | BOOK_NAME | AUTHORNAME | PUBLISHER | PRICE | TYPE | QUANTITY |
|---------|-----------|------------|-----------|-------|------|----------|
| F0001 | The Tears | William Hopkins | First Publ. | 750 | Fiction | 10 |
| F0002 | Thunderbolts | Anna Roberts | First Publ. | 700 | Fiction | 5 |
| T0001 | My first c++ | Brains&Brooke | EPB | 250 | Text | 10 |
| T0002 | C++Brain works | Rossaine | TDH | 325 | Text | 5 |
| C001 | Fast Cook | Lata Kapoore | EPB | 350 | Cookery | 8 |

TABLE:ISSUED

| BOOK_ID | QUANTITY_ISSUED |
|---------|-----------------|
| F0001 | 3 |
| T0001 | 1 |
| C0001 | 5 |

(i) To show BOOK_NAME, AUTHORNAME and PRICE of books of EPB publisher.

(ii) To display the BOOK_NAME and PRICE of the books in descending order of their PRICE.

(iii) To increase the PRICE of all books of First Publ.by 50.

(iv) To Display the BOOK_ID, BOOK_NAME and QUANTITY_ISSUED for all books which have been issued from tables BOOKS and ISSUED.

(v) Select Count(Distinct PUBLISHERS) From Books;

(vi) Select Sum(PRICE) From Books Where QUANTITY>5;

(vii) Select BOOK_NAME,AUTHORNAME From Books Where PRICE<500;

(viii) Select *From Books where AUTHORNAME="EPB";

6 a) Verify the following using Boolean Laws. 2

$U' + V = U'V' + U'.V + U.V$

b) Draw the Logic Circuit for the Boolean Expression : 2

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

c) Write the POS form of a Boolean function F, which is 1 represented in a truth table as follows:

| 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(P, Q, R,

S) = $\Sigma(0,4,5,8,9,10,11,12,13,15)$

7. a) Out of the following, identify client side script (s) and server 1 side script (s).

(i) Javascript (ii) ASP (iii) vbscript (iv) JSP

b) Differentiate between Hacker and Cracker 1

c) Expand the following terms: 1

i) CDMA ii) URL

d) What is Trojan Horse? 2

e) Define the term firewall. 1

f) Ravya Industries has set up its new center at Kaka Nagar for 4 its office and web based activities. The company compound has 4 buildings as shown in the diagram below:

| Raj Building | Fazz Building |
| Harsh Building | Jazz Building |
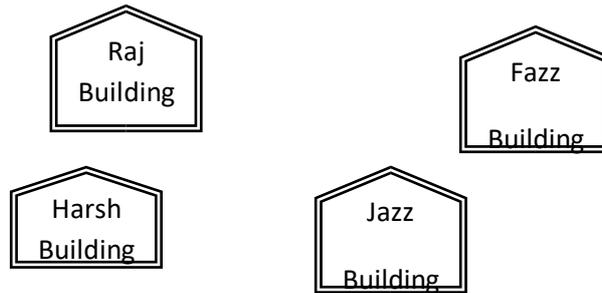
**Centre to centre distances between various buildings**

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

**Number of Computers**

| Harsh Building | 15 |
|---|---|
| Raj Building | 150 |
| Fazz Building | 15 |
| Jazz Bulding | 25 |

(a) Suggest a cable layout of connections between the buildings.
(b) Suggest the most suitable place (i.e. building) to house the server of this organisation with a suitable reason.
(c) Suggest the placement of the following devices with justification:

(i)Internet Connecting Device/Modem (ii)Switch (d)The organisation is planning to link its sale counter situated in various parts of the same city, which type of network out of LAN, MAN or WAN will be formed? Justify your answer.