

**FIRST PREBOARD EXAMINATION (2017-18)**

**CLASS: XII**

**Subject: COMPUTER SCIENCE**

**Date: 11.12.2017**

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 11 printed pages only.
- (4) Please check that this question paper contains 7 questions.

1. a) How you will declare a Character Constant and a String Constant in C++ give example of each?

b) Name the header file(s) that shall be needed for successful compilation of the following C++ code.

```
void main()
{
    char string [10];
    gets(string);
    strcat(string,"JAMES");
    puts(string);
}
```

c) Rewrite the following program after removing the syntax error(s) if any. Underline each correction.

```
#include <iostream.h>
class Train
{
    int trainnumber;
    char TrainName[25];
public:

    void Add()
    {
        cin >> trainnumber;
        gets(TrainName);
    }

    void display()
```

```

        {
            cout<<trainnumber <<":"<<TrainName<<end;
        }
    };
    void main()
    {
        Train T;
        Add.T();
        display.T();
    }

```

d) Find the output of the following program: 2

```

#include<iostream.h> int
m = 10 ;
void pass (int & a , int b , int & c)
{
    int m = 4;
    c + = m ;
    a * = :: m ;
} int
main()
{
    int p = 1, m = 2 ;    pass
(p , :: m, m) ;
    cout << m << ':' << p << ':' <<:: m ;
    cout << endl;
    pass (:: m , p, m) ;
    cout << m << ':' << p << ':' <<:: m ;
}

```

e) The following code generates a set of 4 random numbers. 2

Identify the correct output option(s) out of the four choices given below. Also, write the maximum and the minimum values that can be assigned to the variable number. Assume desired header files are included in the program:

```

const int L=15; void
main()
{
    randomize();    int
P=7, number;
    for (int i=1;i<=4; i++)
    {
        number=L+random(i+P);
        cout<<number<<":";
    }
}

```

```

        P--;
    }
}
i) 19:23:25:17: ii)
20:17:20:18:    iii)
24:19:18:21:
iv) 22:16:15:23:

```

f) Find the output of the following code. 3

```

#include<iostream.h> int
find ( int P )
{
    if ( P>0 )
        return P * 10 ;
    else
        return P +12 ;
}
void Design ( char M , int B = 2 )
{
    for ( int C = 0 ; C < B ; C++ )
    cout <<find( C ) << M ;          cout
    << endl ;
}
int main( )
{
    Design( '*' ) ;
    Design( '$' , 4 ) ;
    Design( '%', 3 ) ;
    return 0 ;
}

```

2. a) Describe the working of constructor and destructor in multiple inheritance? 2

b) Observe the following C++ code and answer the questions (i) 2 and (ii).

Assume all necessary files are included:

```

class FICTION
{
    long FCode;
    char FTitle[20];
    float FPrice; public:
    FICTION() //Member Function 1
    {
        cout<<"Bought"<<endl;
    }
}

```

```

        FCode=100;strcpy(FTitle,"Noname");FPrice=50;
    }
    FICTION(int C,char T[],float P) //Member Function 2
    {
        FCode=C;
        strcpy(FTitle,T);
        FPrice=P;
    }      void Increase(float P) //Member
Function 3
    {
        FPrice+=P;
    }      void Show() //Member
Function 4
    {
cout<<FCode<<":"<<FTitle<<":"<<FPrice<<endl;      }
    ~FICTION() //Member Function 5
    {      cout<< "Fiction
removed!"<<endl;
    } }; void main()
//Line 1
{
    FICTION F1,F2(101,"Dare",75); //Line 2
for (int I=0;I<4;I++) //Line 3
    { //Line 4
        F1.Increase(20);F2.Increase(15); //Line 5
        F1.Show();F2.Show(); //Line 6
    } //Line 7
} //Line 8
//Line 9

```

(i) Which specific concept of object oriented programming out of the following is illustrated by Member Function 1 and Member Function 2 combined together?

(ii) How many times the message "Fiction removed!" will be displayed after executing the above C++ code? Out of Line 1 to Line 9, which line is responsible to display the message "Fiction removed!"?

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

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

```

Public Members

```

- Enter() //A function to allow user to enter values of
           //Mcode,MName,MPop,Area and call CalDen()
           //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: 4 class PRODUCT

```

{
    int Code;
    char Item[20];
protected:
    float Qty; public:
        PRODUCT();
void GetIn(); void Show();
}; class
WHOLESALE
{
    int WCode;
protected: char
Manager[20]; public:
    WHOLESALE(); void
Enter(); void
Display();
}; class SHOWROOM : public PRODUCT, private
WHOLESALE
{ char
Name[20],City[20]; public:
    SHOWROOM();
    void Input();
    void View();
};

```

(i) Which type of Inheritance out of the following is illustrated in the above example?

- (ii) Write the names of all the data members, which are directly accessible from the member functions of class SHOWROOM. (iii) Write the names of all the member functions, which are directly accessible by an object of class SHOWROOM. (iv) What will be the order of execution of the constructors, when an object of class SHOWROOM is declared?
3. a) Write the definition of a function FixPay(float Pay[], int N) in 2 C++, which should modify each element of the array Pay having N elements, as per the following rules:

Existing Value of Pay	Pay to be changed to
If less than 10000	Add 25% in the existing value
If >=10000 and <20000	Add 20% in the existing value
If >=20000	Add 15% in the existing value

- b) T[20][50] is a two dimensional array, which is stored in the 3 memory along the row with each of its element occupying 4 bytes, find the address of the element T[15][5], if the element T[10][8] is stored at the memory location 52000.
- c) Write a function in C++ to delete a node containing employee 4 information from a dynamically allocated stack to employee implemented with the help of the following structure : struct Emp {  
int EmpId; char Name[25];  
Emp \*Next;  
}
- d) 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.
- e) Evaluate the following postfix expression E given below, show 2 the contents of the stack during the evaluation. E=20, 6, 2, ^, 10, 4, %, -, +

4. a) Assume a text file "coordinate.txt" is already created. Using this 2 file create a C++ function to count the number of words having first character capital. Also count the presence of a word 'Do'.

b) A binary file "ADDRESS.DAT", containing records of the 3 following class colony type :

```
class colony
{
    char c_no[10];    char
    c_name[40];      long
    no_of_ppl;
public:
    void getdata()
    {
        gets(c_no); gets(c_name); cin>>no_of_ppl;
    }
    void showdata()
    {
        cout<<"Colony Number : "<<c_no;
        cout<<"Colony Name      : "<<c_name;      cout<<"
        No. of people    : "<<no_of_ppl;
    }
    char * returnname()
    {
        return
        c_name;
    }
    void
    showaddress();
};
```

Write a function showaddress() in C++ that would read contents of file "ADDRESS.DAT" and display the details of those colonies where number of people are greater than 1000.

c) Find the output of the following C++ code considering that the 1 binary file MEM.DAT exists on the hard disk with a data of 1000 members.

```
class MEMBER
{
    int Mcode;char MName[20]; public:
    void Register();void Display();
}; void
main()
{
```

```

fstream MFile;
MFile.open("MEM.DAT",ios::binary|ios::in);
MEMBER M;
MFile.read((char*)&M, sizeof(M));
cout<<"Rec:"<<MFile.tellg()/sizeof(M)<<endl;
MFile.read((char*)&M, sizeof(M));
MFile.read((char*)&M, sizeof(M));
cout<<"Rec:"<<MFile.tellg()/sizeof(M)<<endl;
MFile.close();
}

```

5. a) What do you understand by the terms Alternate key and Foreign 2 Key of a relation?

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

**Table : VEHICLE**

CODE	VTYPE	PERKM
101	VOLVO BUS	160
102	AC DELUXE BUS	150
103	ORDINARY BUS	90
105	SUV	40
104	CAR	20

Note :

- PERKM is Freight Charges per kilometer
- VTYPE is Vehicle Type

**Table : TRAVEL**

NO	NAME	TDATE	KM	CODE	NOP
101	Janish Kin	2015-11-13	200	101	32
103	Vedika Sahai	2016-04-21	100	103	45
105	Tarun Ram	2016-03-23	350	102	42
102	John Fen	2016-02-13	90	102	40
107	Ahmed Khan	2015-01-10	75	104	2
104	Raveena	2016-05-28	80	105	4
106	Kripal Anya	2016-02-06	200	101	25

Note :

- NO is Traveller Number
- KM is Kilometer travelled
- NOP is number of travellers travelled in vehicle
- TDATE is Travel Date

(i) To display NO, NAME, TDATE from the table TRAVEL in descending order of NO.

- (ii) To display the NAME of all the travellers from the table TRAVEL who are travelling by vehicle with code 101 or 102.
- (iii) To display the NO and NAME of those travellers from the table TRAVEL who travelled between '2015-12-31' and '2015-04-01'.
- (iv) To display all the details from table TRAVEL for the travellers, who have travelled distance more than 100 KM in ascending order of NOP.
- (v) `SELECT COUNT (*), CODE FROM TRAVEL  
GROUP BY CODE HAVING COUNT(*)>1;`
- (vi) `SELECT DISTINCT CODE FROM TRAVEL;`
- (vii) `SELECT A.CODE,NAME,VTTYPE  
FROM TRAVEL A,VEHICLE B  
WHERE A.CODE=B.CODE AND KM<90;`
- (viii) `SELECT NAME,KM*PERKM  
FROM TRAVEL A, VEHICLE B  
WHERE A.CODE=B.CODE AND A.CODE='105';`

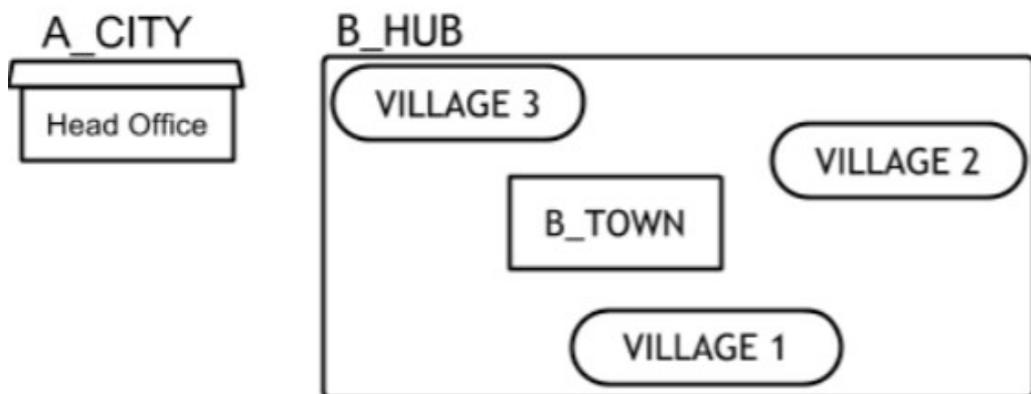
6 a) Verify the following algebraically  $(A'+B').(A+B)=A'.B+A.B'$  2 b) Draw a logical Circuit Diagram for the following Boolean 2

$$\text{Expression: } F = (A'.B) + (A.B) + (B'.C)$$

- c) Write the equivalent Canonical Sum of Product for the following 1  
Product of Sum Expression:  $F(X,Y,Z) = \prod (1,3,6,7)$
  - d) Reduce the following Boolean Expression to its simplest form 3 using K-Map :  $F(X,Y,Z,W) = \Sigma(2,6,7,8,9,10,11,13,14,15)$
7. a) Define the term Bandwidth. Give any one unit of Bandwidth. 1
- b) Difference between PAN and LAN. 1
  - c) What is iMAP? 1
  - d) Compare VB Script and ASP. 1
  - e) What is Telnet? What does it do? 1
  - f) What are cookies? 1

g) Uplifting Skills Hub India is a knowledge and skill community which has an aim to uplift the standard of knowledge and skills in the society. It is planning to setup its training centers in multiple towns and villages pan India with its head offices in the nearest cities. They have created a model of their network with a city, a town and 3 villages as follows.

As a network consultant, you have to suggest the best network related solutions for their issues/problems raised in (i) to (iv), keeping in mind the distances between various locations and other given parameters.



Shortest distances between various locations:

VILLAGE 1 to B_TOWN	2 KM
VILLAGE 2 to B_TOWN	1.0 KM
VILLAGE 3 to B_TOWN	1.5 KM
VILLAGE 1 to VILLAGE 2	3.5 KM
VILLAGE 1 to VILLAGE 3	4.5 KM
VILLAGE 2 to VILLAGE 3	2.5 KM
A_CITY Head Office to B_HUB	25 Km

Number of Computers installed at various locations are as follows:

B_TOWN	120
VILLAGE 1	15
VILLAGE 2	10
VILLAGE 3	15
A_CITY OFFICE	6

Note:

- In Villages, there are community centers, in which one room has been given as training center to this organization to install computers.
  - The organization has got financial support from the government and top IT companies.
- (i) Suggest the most appropriate location of the SERVER in the 1 B\_HUB (out of the 4 locations), to get the best and effective connectivity. Justify your answer.
  - (ii) Suggest the best wired medium and draw the cable layout 1 (location to location) to efficiently connect various locations within the B\_HUB.
  - (iii) Which hardware device will you suggest to connect all the 1 computers within each location of B\_HUB?
  - (iv) Which service/protocol will be most helpful to conduct live 1 interactions of Experts from Head Office and people at all locations of B\_HUB?