CLASS-XII
SAMPLE PAPER
COMPUTER SCIENCE (Theory)

Time Allowed: 3hours *Maximum Marks: 70*

Note. *(i) All questions are compulsory.*
(ii) Programming Language: C+ +

Question 1.
   a) Out of the following find those identifiers, which cannot be used for naming variables or functions in a C++ program: (2)
   Total*Tax, While, class, switch, 3rdRow, finally, Column31, _total
   b) Name the header file to be included for the use of the following built in functions: (1)
        i) frexp( )   ii) toupper( )
   c) Rewrite the following program after removing the syntactical error(s), if any. Underline each correction. (2)
   Note: Assume all required header files are already being included in the program.

```
#define Formula(a,b) = 2*a+b
void main()
{
float X=3;Y=4.1;
Z=Formula(X,Y);
cout<<'Result'<<z<<endl;
}
```

d) Find the output of the following program: (2)
Note: Assume all required header files are already being included in the program.

```
typedef char TEXT[80];

void JumbleUp(TEXT T)
{
int L=strlen(T);
for (int C=0;C<L-1;C+=2)
{
char CT=T[C];
T[C]=T[C+1];
```

```
T[C+1]=CT;
}
for (C=1;C<L;C+=2)
if (T[C]>='S' && T[C]<='U')
T[C]='@';
}

void main()
{
TEXT Str="DEMONETISATION";
 JumbleUp(Str);
 cout<<"\n\n\n\n\n"<<Str<<endl;
}
```

e) Find the output of the following program: (3)

Note : Assume all required header files are already being included in the program.

```
class Share
{
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()
{
```

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```
        Share S,T,U;
        S.GetCode(1240,350);
        T.GetCode(1435,250);
        S.Update(50,28);
        U.Update(-25,26);
        S.Status();
        T.Status();
        U.Status();
        }
```

f). In the following program, find the correct possible output(s) from the options: (2)

```
     #include<stdlib.h>
     #include<iostream.h>
     void main( )
     {
     randomize( );
     char Area [ ] [10]= {"NORTH", "SOUTH", "EAST", "WEST"};
     int ToGo;
     for (int I=0; I<3;I++)
     {
     ToGo = random (3)+1;
     cout<< Area[ToGo]<< ':';
     }
     }
```

OUTPUTS:
i)   SOUTH: EAST: SOUTH: ii) NORTH: SOUTH: EAST:
iii) SOUTH: EAST: WEST: iv) SOUTH: EAST: EAST:

Question 2.
   a) What is the difference between the members in the private visibility mode and the members in
      the protected visibility mode inside a class? Also give a suitable C++ code to illustrate both.
                                                                                          (2)
   b) Answer the questions (i) and (ii) after going through the following class: (2)

```
     class Exam
     {
     int Marks;
     char Subject[20];
     public :
     Exam()                //Function 1
```

```
{
Marks=0;
strcpy(Subject,"Computer");
cout<<"object created\n";
}
Exam(char S[])     // Function 2
{
Marks =0;
strcpy (Subject,S);
cout<<"object created\n";
}
Exam (int M)       // Function3
{
Marks =M;
strcpy(Subject,"Computer");
cout<<"object created\n";
}
Exam(char S[], int M);     // Function 4
};

void main()
{
Exam A, B;               //Statement 1
Exam C(50);              //Statement 2
}
```

(i)   Write statement in C++ that would execute Function 4 of class Exam and also write the definition of Function4.

(ii)   How many times message "object created" will appear on the screen after running statement 1 and statement 2 in the above code. Also write which feature of OOPs is implemented by Function 1, Function 2, Function 3 and Function4 combined together.

(c) Define a class Restra in C++ with the following description :   (4)

Private Members
  ➢ FoodCode of type int
  ➢ Food of type string
  ➢ FType of type string
  ➢ Sticker of type string

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➢ A member function Getsticker() to assign the following values for sticker as per the given FType:

FType	Sticker
Vegetarian	GREEN
Contains Egg	YELLOW
Non-Vegetarian	RED

Public members
➢ A function GetFood() to allow user to enter values for FoodCode, Food, FType and call function GetSticker() to assign Sticker.
➢ A function ShowFood() to view the content of all the data members.

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

```
class ITEM
{
int  Id;
char  IName[20];
protected:
float Qty;
public:
ITEM();
void Enter();
void View();
};
class    TRADER
{
int DCode;
protected:
char Manager[20];
public:
TRADER();
void Enter();
void View();
};
class SALEPOINT :public ITEM, private TRADER
{
char Name[20],Location[20];
public:
SALEPOINT();
void EnterAll();
```

```
void ViewAll();
};
```

(i)   Which type of Inheritance out of the following is illustrated in the above example? Also write the total number of bytes required for creating the object of class SALEPOINT.
(ii) Write the names of all the data members, which are directly accessible from the member functions of class SALEPOINT.
(iii) Write the names of all the member functions, which are directly accessible by an object of class SALEPOINT.
(iv) What will be the order of execution of the constructors, when an object of class SALEPOINT is declared?

Question. 3.
   a) Write function TRANSFER (int A[ ], int B[ ], int Size) in C++ to create the elements of array B[ ] with the help of corresponding elements of array A[ ] i.e. If A[N] is positive number B[N] should be 1, and if A[N] is negative number B[N] should be -1, and if A[N] is zero B[N] should also be 0.   (2)
      For example:

            If the content of array A is
            -98, 56, 0, -23, -34, 54
            The content of array B should become
            -1, 1, 0, -1, -1, 1

   b) An array S[10][30]is stored in the memory along the column with each of the elements occupying 2 bytes. Find out the memory location of S[5][10], if the element S[2][15] is stored at the location 8200.   (3)

   c) Write a function in C++ to perform insert operation in a static circular Queue containing players information (represented with the help of an array of structure PLAYER). (3)
```
            struct PLAYER
            {
            long PID;
            char Pname[20];
            };
```

   d) Write a function in C++ to find sum of each row for a two dimensional integer array having 3 rows and 4 columns which is passed as parameter of the function.   (2)

   e) Evaluate the following postfix notation of expression showing the stack contents for each step of evaluation: (2)
            True, False, AND, True, True, NOT, OR, AND

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f) Convert the following infix expression to its equivalent postfix expression showing stack contents for the conversion: (2)
X – Y / (Z + U) * V

Question. 4.
a) Find the output of the following C++ code considering that the binary file CLIENT. DAT exists on the hard disk with a data of 1000 clients.   (1)

```cpp
class CLIENT
{
int Ccode;
char CName[20];
public:
void Register();
void Display();
};
void main()
{
fstream CFile; CFile.open("CLIENT.DAT",ios::binary|ios::in);
CLIENT        C;
CFile.read((char*)&C, sizeof(C));
cout<<"Rec:"<<CFile.tellg()/sizeof(C)<<endl;
CFile.read((char*)&C, sizeof(C));
CFile.read((char*)&C, sizeof(C));
CFile.read((char*)&C, sizeof(C));
cout<<"Rec:"<<CFile.tellg()/sizeof(C)<<endl;
CFile.close();
}
```

b) Write function definition of DISP3CHAR( ) in C++ to read the contents of a text file KIDS.TXT, and display all those words along with total number of words, which has 3 characters in it. (2)

Example:
If the content of the file KIDS.TXT is as follows :

When I was a small child, I used to play in the garden with my grand mom. Those days were amazingly funful and I remember all the moments of that time.

The function DISP3CHAR( ) should display the following :

was the mom and all the
Total number of words = 6

c) Write a function in C++ to search for a notebook from a binary file "Note.Dat" containing the objects of class NoteBook (as defined below). The user should enter the Model No and the function should search and display the details of the notebook.   (3)

```
class NoteBook
{long ModelNo;
float RAM, HDD;
char Details[20];
public:
void  StockEnter()
{
cin>>ModelNo>>RAM>>HDD;
gets(Details);
}
void  StockDisplay()
{
cout<<ModelNo<<RAM<<HDD<<Details;
}
long ReturnModelNo()
{return(ModelNo);}
};
```

Question. 5.

(a) Observe the following PARTICIPANTS and EVENTS tables carefully and write the name of the RDBMS operation which will be used to produce the output as shown in RESULT? Also, find the Degree and Cardinality of the result.   (2)

Table: PARTICIPANTS

PNO	NAME
1	Arunabha Tariban
2	John Fedricks
3	Kanti Desai

Table:EVENTS

EVENTCODE	EVENTNAME
1001	IT Quiz
1002	Group Debate

Table: RESULT

PNO	NAME	EVENTCODE	EVENTNAME
1	Aruanabha Tariban	1001	IT Quiz
1	Aruanabha Tariban	1002	Group Debate
2	John Fedricks	1001	IT Quiz
2	John Fedricks	1002	Group Debate
3	Kanti Desai	1001	IT Quiz

3	Kanti Desai	1002	Group Debate

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

Table: VEHICLE

VCODE	VEHICLETYPE	PERKM
V01	VOLVO BUS	150
V02	AC DELUXE BUS	125
V03	ORDINARY BUS	80
V05	SUV	30
V04	CAR	18

Note : PERKM is freight charges per Kilometer

Table: TRAVEL

CNO	CNAME	TRAVELDATE	KM	VCODE	NOP
101	K.Niwal	2015-12-13	200	V01	32
103	Fredrick Sym	2016-03-21	120	V03	45
105	Hitesh Jain	2016-04-23	450	V02	42
102	Ravi Anish	2016-01-13	80	V02	40
107	John Malina	2015-01-13	65	V04	2
104	Sahanubhuti	2016-01-28	90	V05	4
106	Ramesh Jaya	2016-04-06	100	V01	25

Note :

- KM is Kilometers travelled
- NOP is number of passengers travelled in vehicle

(i) To display CNO, CNAME, TRAVELDATE from the table TRAVEL in descending order of CNO.

(ii) To display the CNAME of all the customers from the table TRAVEL who are traveling by vehicle with code V01 or V02.

(iii)To display the CNO and CNAME of those customers from the table TRAVEL who travelled between '2015-12-31' and '2015-05-01'.

(iv)To display all the details from table TRAVEL for the customers, who have travel distance more than 120 KM in ascending order of NOP.

(v) SELECT COUNT(*),VCODE FROM TRAVEL GROUP BY VCODE HAVING COUNT(*)>1;

(vi)SELECT DISTINCT VCODE FROM TRAVEL;

(vii) SELECT A.VCODE, CNAME, VEHICLETYPE FROM TRAVEL A, VEHICAL B WHERE A.VCODE=B.VCODE AND KM<90;

(viii) SELECT CNAME, KM*PERKM FROM TRAVEL A, VEHICLE B WHERE A.VCODE=B.VCODE AND A.VCODE='VO5';

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Question. 6.
a) Verify the following using Boolean Laws: (2)
    U'+V=U'V'+U'V+U.V
b) Draw a Logical Circuit Diagram for the following Boolean Expression: (2)
    (X'+Y).Z+W'
 c) Write the Product of Sum form of the function G (U, V, W), Truth table representation of G is as follows: (1)

| U	V	W	G
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	0

  d) Reduce the following Boolean Expression to its simplest form using K-map: (3)

    F (U, V, W, Z) = Σ (0, 1, 4, 5, 6, 7, 8, 9, 11, 15)

Question. 7. Name one client side scripting language and one server side scripting language. (1)
   a)   Write one difference between LAN and PAN. (1)
   b)   Give one example of each – URL and Doman Name. (1)
   c)   What is VoIP? (1)
   d)   What are the characteristics of WEB 3.0 (any two)? (1)
   e)   What are cookies? (1)
   f)   PIONEER Edu Services Ltd. is an educational organization. It is planning to setup its India campus at Chennai with its head office at Delhi. The Chennai campus has 4 main buildings – ADMIN, ENGINEERING, BUSINESS and MEDIA.

      You as a network expert have to suggest the best network related solutions for their problems raised in (i) to (iv), keeping in mind the distances between the buildings and other given parameters.

Delhi

| Head |

Chennai

Campus

| Engineering |
| Admin |
| Business |
| Media |
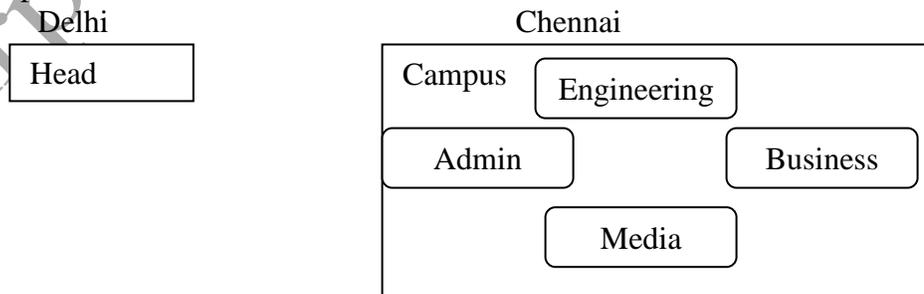
Shortest distances between various buildings:

ADMIN to ENGINEERING	55 m
ADMIN to BUSINESS	90 m
ADMIN to MEDIA	50 m
ENGINEERING to BUSINESS	55 m
ENGINEERING to MEDIA	50 m
BUSINESS to MEDIA	45 m
DELHI Head Office to CHENNAI Campus	2175 km

Numbers of Computers installed at various buildings are as follows:

ADMIN	110
ENGINEERING	75
BUSINESS	40
MEDIA	12
DELHI Head Office	20

(i) Suggest the most appropriate location of the server inside the CHENNAI campus (out of the 4 buildings), to get the best connectivity for maximum no. of computers. Justify your answer.   (1)
(ii) Suggest and draw the cable layout to efficiently connect various buildings within the CHENNAI campus for connecting the computers.   (1)
(iii) Which hardware device will you suggest to be procured by the company to be installed to protect and control the internet uses within the campus?   (1)
(iv) Which of the following will you suggest to establish the online face-to-face communication between the people in the Admin Office of CHENNAI campus and DELHI Head Office?   (1)
        (a) Cable TV
        (b) Email
        (c) Video Conferencing
        (d) Text Chat