COMPUTER SCIENCE (Theory)
Class-XII

Time Allowed: 3hours   *Maximum Marks: 70*
Note.   *(i) All questions are compulsory.*
          (ii) Programming Language: C+ +

Ques 1.
  a) What is the benefit of using default parameter/argument in a function? Giving suitable example to
      illustrate it using C++ code.   2
  b) Write the related library function name based upon the given information in C++. 1
      (i) Get single character using keyboard. This function is available in stdio.h file.
      (ii) To check whether given character is lower case character or not. This function is available in
      ctype.h file.
  c) Rewrite the following C++ program after removing all the syntactical errors (if any), present in the
      code. Make sure you underline each correction done by you in the code: 2
      Important Note.
  •   Assume that all the required header files are already included, which are essential to run this code.
  •   The corrections made by you do not change the logic of the program.

```
typedef char String[80];
void main()
{
Txt String;
getc(Txt);
cout<<Txt[0]<<'\t<<Txt[2];
cout<<Txt<<endline;
}
```

  d) Give the output of the following program: 2

```
#include<iostream.h>
void SwitchOver(int A[], int N, int Split)
{
for(int  K=0;K<N;K++)
if(K<Split)
A[K]+=K;
else
A[K]*=K;
}
void Display(int A[], int N)
```

```
{
for(int  K=0;K<N;K++)
(K%2==0)?cout<<A[K]<<"%":cout<<A[K]<<endl;
}
void main()
{
int H[]={30,40,50,20,10,5};
SwitchOver(H,6,3);
Display(H,4);
}
```

e) Observe the following C++ code carefully and obtain the output, which will appear on the screen after execution of it.   3

```
#include<iostream.h>
class Aroundus
{int Place, Humidity, Temp;
public:
Aroundus(int P=2)
{Place=P;
Humidity=60;
Temp=20;}
void Hot(int T)
{Temp+=T;}
void  Humid(int H)
{
Humidity +=H;
}
void JustSee()
{
cout<<Place<<":"<<Temp<<"&"<<Humidity<<"%"<<endl;
}
};
void main()
{
Aroundus A,B(15);
A.Hot(10);
A.JustSee();
B.Humid(10);
B.Hot(2);
```

```
      B.JustSee();
      A.Humid(5);
      A.JustSee();
      }
```

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 Trick
used in the code at the time when value of Count is 2:   2

```
#include<iostream.h>
#include<stdlib.h>
const int Max=3;
void main( )
{
randomize( );
char Status[] [20]= {"Jammu", "Jharkhand", "Maharashtra" };
int Turn=10, Trick;
for(int count=1;count<4;count++)
{
Trick=random(count);
cout<<Turn-Trick<<Status[Trick]<<"#";
}
}
```

i) 10Jammu#10Jammu#8Maharashtra#
ii) 10Jammu#8Maharashtra#9Jharkhand#
iii) 10Jammu#9Jharkhand#10Jammu#
iv) 10Jammu#10Jharkhand#8Maharashtra#

Ques 2.
a) Reusability of classes is one of the major properties of OOP. How is it implemented in C++?   2
b) Answer the questions (i) and (ii) after going through the following class: 2

```
class Hospital
{
int Pno, Dno;
public:
Hospital(int Pn);        //Function 1
Hospital( );             //Function 2
Hospital(Hospital &H);   //Function 3
void In();      //Function 4
void Disp();    //Function 5
```

```
        };
        void main( )
        { Hospital H(20);        //Statement 1
        }
```

i.   Which member function out of Function 1, Function 2, Function 3, and Function 4, Function 5
     will get executed when the Statement 1 is executed in the above code?
ii. Write a statement to declare a new object G with reference to already existing object H using
     function 3.

c)   Define a class CAR_RENTAL in C++ with the following description: 4
     private members:
     CarId of type int
     AboutCar of type string
     Cartype of type string
     Rent of type float
     A member function AssignRent( ) to assign the value of Rent as per the following

CArtype	Rent
Small	1000
Van	800
SUV	2500

     public Members
     A function GetCar() to allow user to enter the value for CarId, AboutCar, Cartype and call
     function AssignRent() to assign rent.
     A function ShowCar( ) to allow user to view the content of all the data members.

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

```
class customer
{
private:
int custno;
char name[20];
 protected:
void Register( );
public:
customer( );
void status( ); };
class salesman
{ private:
int sno;
char sname[20];
```

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protected:
float salary;
public:
salesman( );
void enter( );
void show( ); };
class shop: private customer, public salesman
{ char vno[10];
char sdate[8];
public:
shop( );
void salesentry( );
void sales_detail ( ); };

   i.   Write name of data members which are accessible from object belonging to class customer.

  ii.   Write names of all the members which are accessible from object belonging of class salesman.

 iii.   Write names of all the member function which are accessible from member function of class shop.

 iv.   How many bytes will be required by an object belonging to class shop?

Ques.3

a) Write a function TRANSFER(int A[], int B[], int Size) in C++ to copy the elements of array A into array B in such a way that all the negative elements of A appear in the beginning of B, followed by all the positive elements, followed by all the zeroes maintaining their respective orders in array A. 3

For example:

If the contents of array A are:

7, -23, 3, 0, -8,-3,4, 0

The contents of array B should be

-23 , -8, -3, 7, 3, 4, 0, 0

b) An array Arr[15][20] is stored in the memory along the row with each element occupying 4 bytes. Find out the Base Address and address of the element Arr[3][2], if the element [5][2] is stored at the address 1500. 3

c) Give the necessary declaration of queue containing integer. Write a user defined function in C++ to delete an integer from the queue. The queue is to be implemented as a linked list 3.

d) Write a function in C++ to print the sum of all the values of middle row and middle column of an array. Assume the size of array is of odd value. i.e. 3,5,7 etc 3

For example if array of 5 row and 5 column is as follows:

2	4	5	6	15
15	4	3	7	19
13	5	13	5	1

---

e

| 5 | 8 | 4 | 20 | 25 |
| 53 | 41 | 30 | 17 | 90 |

Then the output should be:
Sum of Middle Row is: 37
Sum of Middle Col is: 55

e) Evaluate the following postfix notation of expression. Show the status of stack after execution of each operaration: 2
5, 2, *, 50, 5, /, 5, -, +

Ques 4.
a) Observe the program segment given below carefully and answer the questions that follows: 1
class Stock
{
long Ino;
char Item[20];
int Qty;
public:
void Get(int); //Function to enter the content
void show(); // Function to display the content
void purchase(int Tqty)//function to increment in qty
{
Qty+= Tqty;
}
long KnowIno()
{
return Ino;
}   };
void PurchaseItem(long PIno, int Pqty)
{
fstream File;
File.open("Item.dat", ios::binary|ios::in|ios::out); int Pos =- 1;
Stock S;
while(Pos == -1 && File.read((char*)&S,sizeof(S)))
{
if(S.KnowIno() == PIno)
{
S.purchase(Pqty);
Pos = File.tellg() - sizeof(S);
_____// to place the file pointer to the required position.

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_____// to write the object S on to a binary file.

```
    }
    }
    if(Pos == -1)
    cout<<"No updation done as required Ino not found";
    File.close();     }
```

b) Write a function in C++ to count and display the number of words starting with alphabet 'A' or 'a'or 'p' or 'P' or 'k' or 'K' present in a text file "poem.txt".   2

Example

If the file "poem.txt" contains the following lines,

Kamlesh is captain of Udaipur cricket team.

Tourist generally visit Zoo of Udaipur.

Today telephone is dead, please note down complain.

Then the output should be 2

c) Given a binary file "AMOUNT.DAT",containing records of the given class outstand type. 3

```
    class outstand
    {
    int memno;
    int outamt;
    public:
    void getit()
    {
    cin>>memno>>outamt;
    }
    void putit()
    {
     cout<<memno<<outamt;
     }
    int returnamt()
    {
    return outamt;
    }
    };
```
Write a function in C++ to write objects having outamt more than Rs. 10,000 into CRITICAL.DAT file.

Ques5.

a)   What do you mean by Candidate Key and Foreign Key?   2

b)   Consider the following tables STORE and SUPPLIERS . Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii).   6

Table: STORES

ItemNo	Item	Scode	Qty	Rate	LastBuy
2005	Sharpner Classic	23	60	8	31-Jun-09
2003	Ball Pen 0.25	22	50	25	01-Feb-10
2002	Gel Pen Premium	21	150	12	24-Feb-10
2006	Gel Pen Classic	21	250	20	11-Mar-09
2001	Eraser Small	22	220	6	19-Jan-09
2004	Eraser Big	22	110	8	02-Dec-09
2009	Ball Pen 0.5	21	180	18	03-Nov-09

Table: SUPPLIERS

Scode	Sname
21	Premium Stationary
23	Soft Plastics
22	Tetra Supply

i)   To display details of all the items in the Store table in ascending order of LastBuy.

ii)   To display Itemno and item name of those items from store table whose rate is more than 15 rupees.

iii)   To display the details of those items whose supplier code is 22 or Quantity in store is more than 110 from the table Store.

iv)   To display minimum rate of items for each Supplier individually as per Scode from the table Store.

v)   SELECT COUNT(DISTINCT Scode) FROM STORE;

vi)   SELECT Rate*Qty FROM STORE WHERE Itemno=2004;

vii)   SELECT Item,Sname FROM STORE S, SUPPLIER P WHERE S.Scode=P.Scode AND ItemNo=2006.

viii)   SELECT MAX(LastBuy)FROM STORE;

Ques6

a) State and algebraically verify Absorption Law.   2

b) Draw the logic circuit diagram from the following expression: 2
    Y=ab+b'c+c'a'

c) Write the equivalent Caononical Product of Sum Expression for the following Sum of Product Expression: 1
    F(X,Y,Z)=∑(0,2,4,5)

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

F(P,Q,R,S)= π(0,1,3,5,6,7,10,14,15)

Ques 7
    a) Write the advantages of unguided transmission media.   1
    b) What is the difference between domain name and IP Address?   1
    c) Name one Client side scripting language and one Server side scripting language.   1
    d) Expand the following terms: 1
        i. W3C
        ii. FLOSS
    e) Tech Up Corporation (TUC) is a professional consultancy company. The company is planning to set up their new offices in India with its hub at Hyderabad. As a network adviser you have to understand their requirement and suggest them the best available solutions. Their queries are mentioned as (i) to (iv) below: 4

| Conference Block | Finance Block | Human Resource Block |

Block to Block distance (in Mtrs)

Block (From)	Block (To)	Distance
Human Resource	Conference	60
Human Resource	Finance	120
Conference	Finance	80

Block	Computers
Human Resource	125
Finance	25
Conference	60

    i) What will be the most appropriate block, Where TUC should plan to install the server?
    ii) Draw a block to block cable layout to connect all the buildings in the most appropriate manner for efficient communication.
    iii) What will be the best possible connectivity out of the following, you will suggest to connect the new setup of offices in Banglore with its London based office?

$\prod$ Infrared $\prod$ Satellite link $\prod$ Ethernet Cable

    iv) Which of the following devices will be suggested by you to connect each computer in each building?

$\prod$ Gateway $\prod$ Switch $\prod$ Modem

    f) What do you mean by Firewall?   1
    g) Differentiate between Freeware and Shareware.   1