

# COMPUTER SCIENCE (Theory)

## CLASS-XII

*Time Allowed: 3hours*

*Maximum Marks: 70*

*Note. (i) All questions are compulsory.*

*(ii) Programming Language: C++*

### Ques 1.

- a) Differentiate between an identifier and keywords. 2
- b) Name the header files, to which following inbuilt function belong to: 1
- i. log10()
  - ii. arc()
- c) Identify the errors in the following program code: 2
- ```
#include<iostream.h>
class int
{
int I,j;
public:
int(int a, int b)
{
I=a; j=b;
}
};
class class2
{
int I,j;
Public:
class2(int a, int b)
{
I=a; j=b;
}
};
int main()
{
int x(10,20);
class2 y;
x=y;
}
```
- d) Give the output of the following program: 2

```
#include<iostream.h>
int global=10;
void func(int &x, int y)
{
x=x-y ;y=x*10 ;
cout<<x<<','<<y <<"\n";
}
void main()
{
int global=7 ;
func( ::global,global) ;
cout<<global<<','<<::global<<"\n";
func(global,::global) ;
cout<<global<<','<<::global<<"\n";
}
```

e) Find the output of the following program :

3

```
#include<iostream.h>
#include<string.h>
#include<ctype.h>
void Change(char Msg[], int Len)
{
for(int Count=0;Count<Len;Count++)
{
if(islower(Msg[Count]))
Msg[Count]=toupper(Msg[Count]);
else if(isupper(Msg[Count]))
Msg[Count]=tolower(Msg[Count]);
else if(isdigit(Msg[Count]))
Msg[Count]=Msg[Count]+1;
else Msg[Count]='*';
}
}
void main()
{
char Message[]="2011 World Cup Ahead";
int Size=strlen(Message);
Change(Message,Size);
cout<<Message<<endl;
for(int C=0,R=Size-1;C<=Size/2;C++,R--)
{
char Temp=Message[C];
```

```

Message[C]=Message[R];
Message[R]=Temp;
}
cout<<Message<<endl;
}

```

f) Study the following program and select the possible output from it:. Also justify your answer. 2

```

#include<iostream.h>
#include<stdlib.h>
const int Max=3;
void main()
{
randomize( );
int Div;
Div=1+random(Max);
for(int N=1;N<5;N++)
{
cout<<100%Div<<"#";
}
}

```

- i) 0#0#0#0#
- ii) 1#1#1#1#
- iii) 2#2#2#2#
- iv) 3#3#3#3#

**Ques 2.**

- a) What is Function Overloading? Give an example in C++ to illustrate the same. 2
- b) Answer the questions (i) and (ii) after going through the following program: 2

```

#include<iostream.h>
#include<string.h>
class AirIndia
{
char flno;
int Nop;
public:
AirIndia() //function1
{
strcpy(flno,"");
Nop=0;
}
AirIndia( char *str,int n) //function2
{

```

```

strcpy(flno,str);
Nop=n;
}
void input                //function3
{
cin>>flno;
cin>>Nop;
}
~AirIndia()              //function4
{
cout<<"counter closed"<<endl;
}
};

```

- (i) In Object Oriented Programming, which concept is illustrated by Function1 and Function2 together? Write the statement to call these functions.
- (ii) What is the scope of two data members of the class AirIndia? What does the scope of data members depend upon?
- c) Define a class cricket in C++ with the following description: 4

**Private members:**

- Target\_score of type integer
- Overs\_bowled of type integer
- Extra\_time of type integer
- Penalty of type integer
- Cal\_penalty() a member function to calculate penalty as follows:  
If extra\_time<=10, penalty=1  
If extra\_time>10 but <=20 penalty=2, otherwise, penalty=5

**Public members:**

- A function Extradata () to allow user to enter values for target\_score, over\_bowled, Extra\_time.
- A function DspData() to allow user to view the contents of all data members. 4

- d) Consider the following and answer the questions given below:

```

class MNC
{
char Cname[25];
protected:
char Hoffice[25];
public:
MNC();
char Country[25];
void EnterDate ();
void DisplayData ();

```

```

};
class Branch:public MNC
{
long NOE;
char Ctry[25];
protected:
void Association( );
public:
Branch( );
void Add( );
void Show( );
};
class Outler: public Branch
{
char State[25];
public:
Outlet( );
void Enter ( );
void Output();
};

```

- i) Which class's constructor will be called first at the time of declaration of an object of class Outlet?
- ii) How many bytes an object belonging to class Outlet require?
- iii) Name the member function(s), which are accessed from the object(s) of class Outlet.
- iv) Name the data member(s), which are accessible from the object(s) of class Branch

**Ques.3**

- a) Write a function in C++ which accepts a 2D array of integers and its size as arguments and display the elements which lie on diagonals. 3

[Assuming the 2D array to be a square matrix with odd dimension, i.e., 3x3, 5x5, etc..]

Example, if the array contents is

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

Output through the function should be :

Diagonal One : 5 7 9

Diagonal Two: 3 7 1

- 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. 4
- 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 which are either divisible by 2 or are divisible by 3 present in a two-dimensional array passed as the argument to the function. 2
- e) Evaluate the following postfix notation of expression: 2  
 $10\ 20 + 25\ 15 - * 30 /$

Ques 4.

- a) Observe the program segment given below carefully and fill the blanks marked statement 1 and statement 2 using seekg() and tellg() function for performing the required task. 1

```
#include<fstream.h>
class Employee
{
int Eno;
char Ename[30];
public:
//Function to count the total number of records
int Countrec( );
};
int Employee:: Countrec( )
{
fstream File;
File.open("Emp.Dat",ios::binary||ios::in);
_____ // Statement 1
int Bytes = _____ // Statement 2
int count = Bytes/sizeof(item);
File.close( );
return count;
}
```

- b) Write a function in C++ to count the number of alphabets present in a textfile "Para.Txt". 2
- c) Write a function in C++ to add new objects at the bottom of a binary file "Student.Dat", assuming the binary file is containing the object of the following class 3

```
class STUD
{
int Rno;
char Name[20];
public:
void Enter ()
{
cin>>Rno;
gets(Name);
}
void Display()
{
cout<<Rno<<Name<<endl;
}};
```

Ques5.

- a) What do you mean by Candidate Key and Foreign Key? 2  
 b) Consider the following tables STORE and SUPPLIERS a. 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 |

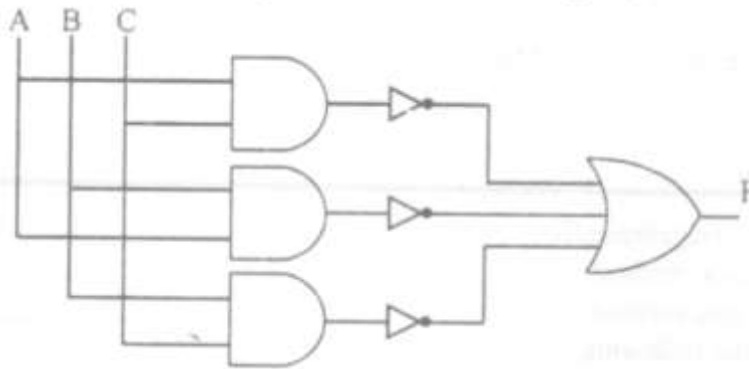
**Table: SUPPLIERS**

| 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 verify Associative Law. 2  
 b) Write the equivalent expression for the following Logic Circuit: 1



c) Convert the following Boolean expression into its equivalent Canonical Product of Sum Form(POS) 1

$$A.B'.C+A'.B.C+A'.B.C'$$

d) Reduce the following Boolean Expression using K-Map: 4

$$F(P,Q,R,S)=\sum(0,3,5,6,7,11,12,15)$$

Ques. 7.

a) Name the two transmission media for networking. Also write one advantage for each. 2

b) Expand the following terms: 1

i) XML      ii) GSM

c) Differentiate between Hackers and Crackers? 1

d) Indian Public School in Darjeeling is setting up the network between the different wings. There are 4 wings names as Senior(S), Junior(J), Admin(A) and Hostel(H). 4

Distance between various wings

|                  |      |
|------------------|------|
| Wing A to Wing S | 100m |
| Wing A to Wing J | 200m |
| Wing A to Wing H | 400m |
| Wing S to Wing J | 300m |
| Wing S to Wing H | 100m |
| Wing J to Wing H | 450m |

|        |     |
|--------|-----|
| Wing A | 10  |
| Wing S | 200 |
| Wing J | 100 |
| Wing H | 50  |

i) Suggest a suitable Topology for Networking the computer of all wings

ii) Name the wing where the server is to be installed. Justify your answer.

iii) Suggest the placement of Hub/Switch in the network.

iv) Mention an economic technology to provide internet accessibility to all wings.

e) What do you mean by Cyber law? 1

f) What do you mean by free software? 1