Sample Paper – 2014
Class – XII
Subject – COMPUTER SCIENCE

Instructions:
- ***i) All questions are compulsory.***
- ***ii) Programming Language : C++***

1. a) What are static data members and illustrate their properties? 2

   b) Name the header files that will be needed for the following code: 2

```
void main( )
{
    char *p;
    float s;
    gets(p);
    s = atof(p);
    cout<<p<<setprecision(2)<<s;
}
```

c) Give the output of the following code. 3

```
#include<iostream.h>
int a=10;
void main()
{
void demo(int &,int,int*);
int a=20,b=5;
demo(::a,a,&b);
cout<<::a<<'\t'<<a<<'\t'<<b<<endl;
}
void demo(int &x, int y, int *z)
{
a+=x;
y*=a;
*z=a+y;
cout<<x<<y<<*z<<endl;
}
```

d) Find the output of the following program: 1

```
#include<iostream.h>
#include<ctype.h>

void main ( )
{
char Text [ ] = "Mind@Work!";
for (int I = 0; Text [I] != '\0'; I++)
{
if (!isalpha (Text[I]))
Text [I] = '*';
else if (isupper (Text[I]))
Text [I] = Text [I] + 1 ;
else
Text [I] = Text [I+ 1];
}
cout<<Text;
}
```

e) Give the output of the following program. 3

```
#include<iostream.h>
void sumfn(int last)
{
auto int sum = 0;
static int sum2 = 0;
for( int i = last; i > 0; i-- )
sum += i;
sum2 += sum;
cout<<sum<<" "<<sum2<<endl;
}
void main( )
{
for( int i = 1; i < 7; i++)
sumfn(i);
}
```

2. a. Differentiate between public and private visibility modes in context of Object Oriented Programming using a suitable example illustrating each. 2

b. Define a class **Garments** in C++ with the following descriptions: 4

Private Members:
GCode of type string
GType of type string
GSize of type integer
GFabric of type string
GPrice of type float
A function Assign ( ) which calculates and assigns the value of GPrice as follows
For the value of GFabric as "COTTON",

GType	GPrice(Rs)
TROUSER	1300
SHIRT	1100

For GFabric other than "COTTON" the above mentioned GPrice gets reduced by 10%.
Public Members:

- A constructor to assign initial values of GCode, GType and GFabric with the word "NOT ALLOTTED" and GSize and GPrice with 0
- A function Input ( ) to input the values of the data members GCode, GType, GSize and GFabric and invoke the Assign ( ) function.
- A function Display ( ) which displays the content of all the data members for a Garment.

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

```
class PUBLISHER
{
char Pub[12];
double Turnover;
protected:
void Register();
public:
PUBLISHER();
void Enter();
void Display();
};
class BRANCH
{
char CITY[20];
protected:
```

```
float Employees;
public:
BRANCH();
void Haveit();
void Giveit();
};
class AUTHOR : private BRANCH , public PUBLISHER
{
int Acode;
char Aname[20];
float Amount;
public:
AUTHOR();
void Start();
void Show();
};
```

(i) Write the names of data members, which are accessible from objects belonging to class AUTHOR.

(ii) Write the names of all the member functions which are accessible from objects belonging to class BRANCH.

(iii) Write the names of all the members which are accessible from member functions of class AUTHOR.

(iv) How many bytes will be required by an object belonging to class AUTHOR?

3 a. Write a program that display the size of a file in bytes. 2

b. Observe the program segment given below carefully, and answer the question that follows: 1

```
class Applicant
{
long AId;                    //Applicant's Id
char Name [20] ;             //Applicant's Name
float Score;                 //Applicant's Score
public:
void Enroll ( );
void Disp ( ) ;
void MarksScore ( );         / /Function to change Score
long R_AId () {retumAId;)
} ;
void ScoreUpdate (long Id)
{
fstream File;
File.open ("APPLI.DAT",ios::binary|ios::in|ios::out);
Applicant A;
int Record = 0, Found = 0 ;
while (!Found && File.read((char*) &C, sizeof(c)))
{
if(Id ==A.R_AId ( ))
{
cout<<"Enter new Score" ;
A.MarksScore ( );
_____                        / / Statement 1
_____                        / /Statement 2
Found = 1;
}
Record ++;
}
```

```
if (Found ==1) cout<<"Record Updated";
File.close ( ) ;
}
```

Write the Statement1 **to position** the File Pointer at the beginning of the Record for which the Applicant's ld matches with the argument passed, and Statement2 **to write** the updated Record at that position.

c. Given a binary file PHONE.DAT, containing records of the following structure type 3

```
class Phonlist
{
char Name [20] ;
char Address[30];
char AreaCode[5];
char PhoneNo[15] ;
public:
void Register () ;
Void Show ( ) ;
int CheckCode (char AC [ ])
{
return strcmp (AreaCode, AC) ;
}
} ;
```

Write a function TRANSFER ( ) in C++, that would copy all those records which are having AreaCode as "DEL" from PHONE.DAT to PHONBACK.DAT.

4 a. Given two arrays of integers A and B of sizes M and N respectively. Write a function named MIX() which will produce a third array named C, such that the following sequence is followed :
All even numbers of A from left to right are copied into C from left to right.
All odd numbers of A from left to right are copied into C from right to left
All even numbers of B from left to right are copied into C from left to right.
All odd numbers of B from left to right are copied into C from right to left
A, B and C are passed as arguments to MIX(). 4

b. Suppose an array P containing float is arranged in ascending order. Write a user defined function in C++ to search for one float from P with the help of binary search method. The function should return an integer 0 to show absence of the number and integer 1 to show presence of the number in the array. The function should have the parameters as (1) an array (2) the number DATA to be searched (3) number of element N. 3

c. Write a function which accepts a 2D array of integers, number of rows and number of columns as arguments and assign the elements which are divisible by 3 or 5 into a one dimensional array of integers. 3
If the 2D array is

11	5	28	18
19	32	45	27
24	25	16	31
12	3	9	14

The resultant 1D arrays is 12 , 3 , 9 , 24 , 25 , 45 , 9 , 5 , 18

d. An array X[20[20] is stored in the memory with each element requiring 4 bytes of storage. If the address of X[10[12] is 2596,find out the memory location X[12[14] for row major arrangement. 3

e. Convert ((A + B) – ((C + D) * E/ F) * G) into postfix form showing stack status after every step in tabular form. 3

f. Each node of a STACK containing the following information, in addition to required pointer field: 3

Roll no. of the student
Age of the student.
Give the structure of node for the linked stack in question.

TOP is a pointer to the topmost node of the STACK. Write the following function:

PUSH ( ) – TO push a node in to the stack which is allocated dynamically.
POP ( ) – Te remove a node from the stack and to release the memory.

5 a. What are the different constraints that can be applied on the table? 2

b. Write SQL commands for i) to iv) and the outputs for v) on the basis of tables FURNITURE and ARRIVALS. 6

TABLE FURNITURE

NO	ITEMNAME	TYPE	DATEOFSTOCK	PRICE	DISCOUNT
1	White lotus	Double Bed	23-02-09	30000	25
2	Pink feather	Baby cot	20-01-09	7000	20
3	Dolphin	Baby cot	19-02-09	9500	20
4	Decent	Office Table	01-01-09	25000	30
5	Comfort zone	Double Bed	12-01-09	25000	25
6	Donald	Baby cot	24-02-09	6500	15
7	Royal Finish	Office Table	20-02-09	18000	30
8	Royal tiger	Sofa	22-02-09	31000	30
9	Econo sitting	Sofa	13-12-08	9500	25
10	Eating Paradise	Dining Table	19-02-09	11500	25

TABLE ARRIVALS

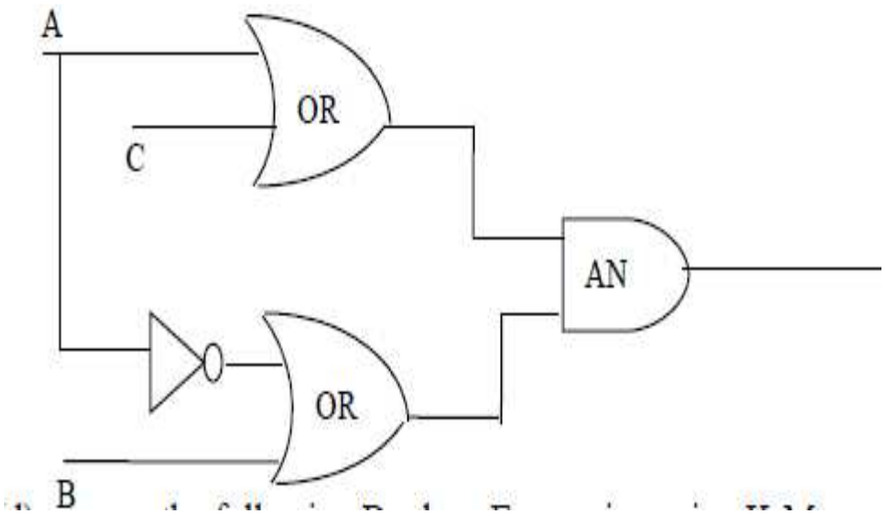
NO	ITEMNAME	TYPE	DATEOFSTOCK	PRICE	DISCOUNT
11	Wood Comfort	Double Bed	23-03-10	2500	25
12	Old fox	Sofa	20-02-10	17000	20
13	Micky	Baby cot	21-02-10	7500	15

i) To list the items those are priced at more than 15000 from FURNITURE table.
ii) To list the items and their type which were stocked before 22/01/08 in the descending order of items.
iii) To display items and their dateof stock where the discount percentage is more than 25.
iv) To count the number of items whose type is “Sofa”.

v) Give the outputs for the following statements.
1. SELECT COUNT (DISTINCT TYPE) FORM FURNITURE;
2. SELECT MAX(DISCOUNT) FROM FURNITURE , ARRIVALS;
3. SELECT AVG(DISOCUNT) FROM FURNITURE WHERE TYPE = “Baby cot”;
4. SELECT SUM(PRICE) FROM FURNITURE WHERE DATOFSTOCK < ‘12/02/09’;

6 a. State and verify Demorgan's Laws algebraically. 2

b. Write the equivalent Boolean Expression for the following Logic Circuit 2



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

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
$F(A,B,C,D)= \sum (0,1,2,4,5,6,8,10)$

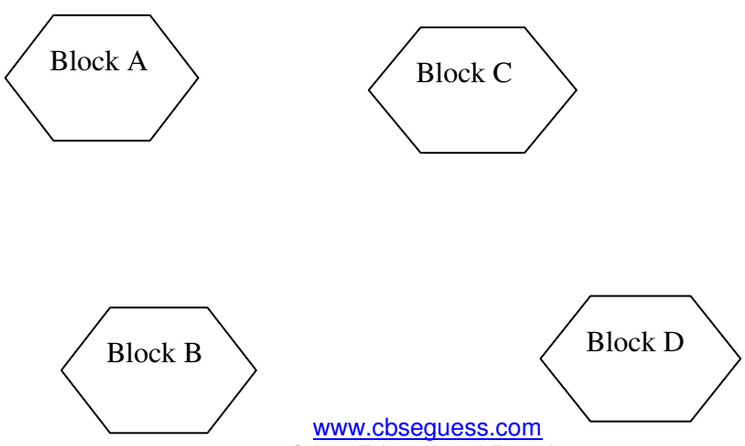
7 a. Compare any two Switching techniques. 1

b. Which of the following is not a Client Side script: 1
(i) VB Script (ii) Java Script
(iii) ASP (iv) PHP

c. If someone has hacked your Website, to whom you lodge the Complain? 1

d. What do you mean by IP Address? How is it useful in Computer Security? 1

e. Knowledge Supplement Organisation has set up its new center at Mangalore for its office and web based activities. It has 4 blocks of buildings as shown in the diagram below: 4



Center to center distances between various blocks

Black A to Block B	50 m
Block B to Block C	150 m
Block C to Block D	25 m
Block A to Block D	170 m
Block B to Block D	125 m
Block A to Block C	90 m

Number of Computers

Black A	25
Block B	50
Block C	125
Block D	10

1) Suggest a cable layout of connections between the blocks.

2) Suggest the most suitable place (i.e. block) to house the server of this organisation with a suitable reason.

3) Suggest the placement of the following devices with justification
   (i) Repeater
   (ii) Hub/Switch

4) The organization is planning to link its front office situated in the city in a hilly region where cable connection is not feasible, suggest an economic way to connect it with reasonably high speed?

f. What do you mean by Spam Mails? How can you protect your mailbox from Spams? 1

g. Mention any two advantages of Open Source Software over Proprietary Software.

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