

KENDRIYA VIDYALAYA SANGATHAN: CHENNAI REGION
CLASS XII COMMON PRE-BOARD EXAMINATION 2016-17

Subject: Computer Science (083)

Time: 3 Hrs.

Max. Marks: 70

General Instructions:

- 1) All questions are compulsory.
- 2) Programming Language: C++

1. (a) What do you mean by Self referential Structure? Give a suitable example to illustrate it using C++ Code. 2
- (b) Write the names of header files to which the following belong: 1
 - (i) strcmpi()(ii) randomize()
- (c) Rewrite the following program after removing any syntactical errors. Underline each correction made. 2

```
#include<'iostream.h'>
void main( )
int A[10];
A=[3,2,5,4,7,9,10];
for( p = 0; p<=6; p++)
{
if(A[p]%2=0)
int S = S+A[p];
}
cout<<S;
}
```

- (d) Find the output of the following C++ program: 2

```
#include<iostream.h>
void repch(char s[])
{
for (inti=0;s[i]!='\0';i++)
{
if(((i%2)!=0) &&(s[i]!=s[i+1]))
{
s[i]='@';
cout<<"Hello";
}
else
if (s[i]==s[i+1])
{
s[i+1]='!';
i++;
}
}
}
void main()
{
char str[]="SUCCESS";
```

```

cout<<"Original String"<<str
repch(str);
cout<<"Changed String"<<str;
}

```

(e) Find the output of the following :

3

```

#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,6);
}

```

(f) In the following program, if the value of N given by the user is 20, what maximum and minimum values the program could possibly display? 2

```

#include <iostream.h>
#include <stdlib.h>
void main()
{
    intN,Guessnum;
    randomize();
    cin>>N;
    Guessnum=random(N-10)+10;
    cout<<Guessnum<<endl;
}

```

2. (a) Explain static member and member function inside the class.? Give a suitable example to invoke the static members inside the class . 2

(b) Answer the questions (i) and (ii) after going through the following class : 2

```

class Exam
{
    int Rollno;
    char Cname[25];
    float Marks ;
public :
    Exam( )
    {
        //Function 1
        Rollno = 0 ;
        strcpy(Cname,"");
        Marks=0.0;
    }
}

```

```

Exam(intRno, char candname)      //Function 2
{
Rollno = Rno ;
strcpy(Cname,candname);
}
~Exam()                          //Function 3
{
cout<< "Result will be intimated shortly" <<endl ;
}
void Display( )                  //Function 4
{
cout<< "Roll no :."<<Rollno;
cout<<"Name :."<<Cname;
cout<<" Marks:"<<Marks;
}
};

```

(i) Which OOP concept does Function 1 and Function 2 implement? Explain?

(ii) What is Function 3 called? When will it be invoked?

(c) Define a class FLATRENT in C++ with following description:

4

Private members:

- FlatId of type long int
- AboutFlat of type string
- FlatType of type string
- Rent of Type float
- A member function AssignRent() to assign the following values for rent as per given FlatType:

FlatType	Rent
1BHK	10000
2BHK	15000
3BHK	20000

Public members:

- A function GetFlat() to allow user to enter values for FlatId, AboutFlat, FlatType and call function AssignRent() to assign Rent.
- A function ShowFlat() to allow user to view the content of all the data members of class.

(d) Give the following class definition answer the question that is follow:

4

```

class University
{
char name [20];

protected :
char vc[20];

public :
void estd();
void inputdata();
void outputdata();
};

```

```

class College : protected University
{
int regno;
protected
char principal();
public :
int no_of_students;
void readdata();
void dispdata ( );
};

```

```

class Department : public College
{
char name[20];
char HOD[20];

public :
void fetchdata(int);
void displaydata( );
};

```

- i). Name the base class and derived class of college.
- ii) Name the data member(s) that can be accessed from function displaydata().
- iii) What type of inheritance is depicted in the above class definition?
- iv) What will be the size of an object (in bytes) of class Department?

3. (a) Write a function SORTSCORE () in C++ to sort an array of structure.
 Examinee in descending order of Score using Bubble Sort.

3

Note: Assume the following definition of structure Examinee.

```

struct Examinee
{
longRollNo;
char Name[20];
float Score;
};

```

Sample Content of the array (before sorting)

RollNo	Name	Score
1001	RavyankKapur	300
1005	Farida Khan	289
1002	Anika Jain	345
1003	George Peter	297

Sample Content of the array (after sorting)

RollNo	Name	Score
1002	Anika Jain	345
1001	RavyankKapur	300
1003	George Peter	297
1005	Farida Khan	289

(b) An array T[50][20] is stored in the memory along the column with each of the elements occupying 4 bytes. Find out the base address and address of element T[30][15], if an element T[25][10] is stored at the memory location 9800. 3

(c) Write a function NewMAT(int A[][],intr,int c) in C++, which accepts a 2d array of integer and its size as parameters divide all those array elements by 6 which are not in the range 60 to 600(both values inclusive) in the 2d Array . 2

(d) Write a function in C++ to delete a node containing Books information, from a dynamically allocated Stack of Books implemented with the help of the following structure. 4

```
struct Book
{
int BNo ;
char BName[20] ;
Book *Next ;
};
```

(e) Evaluate the following postfix notation of expression: 2
20, 30, +, 50, 40, - ,

4. (a) Observe the program segment given below carefully and fill the blanks marked as Statement 1 and Statement 2 using seekg() and tellg() functions for performing the required task. 1

```
#include <fstream.h>
class Company
{
int Eno;
char Ename[20];
public: //Function to count the total number of records
int Countrec();
};

int Item::Countrec()
{
fstream File;
File.open("CMP.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 word "this" (including "This"/"THIS" too) present in a text file "DIARY.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 objects 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;
}
};

```

5. (a) Explain select and projection operations in relational Algebra with example. 2

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

Table: MATERIAL

MCODE	TYPE
M001	TERELENE
M002	COTTON
M004	POLYESTER
M003	SILK

Table: DRESS

DCODE	DESCRIPTION	PRICE	MCODE	LAUNCHDATE
10001	FORMAL SHIRT	1250	M001	12-JAN-08
10020	FROCK	750	M004	09-SEP-07
10012	INFORMAL SHIRT	1450	M002	06-JUN-08
10019	EVENING GOWN	850	M003	06-JUN-08
10090	TULIP SKIRT	850	M002	31-MAR-07
10023	PENCIL SKIRT	1250	M003	19-DEC-08
10089	SLACKS	850	M003	20-OCT-08
10007	FORMAL PANT	1450	M001	09-MAR-08
10009	INFORMAL PANT	1400	M002	20-OCT-08
10024	BABY TOP	650	M003	07-APR-08

- (i) To display DCODE and DESCRIPTION of a each dress in ascending order of DCODE.
- (ii) To display the details of all the dresses which have LAUNCHDATE in between 05-DEC-07 and 20-JUN-08 (inclusive of both the dates).
- (iii) To display the average PRICE of all the dresses which are made up of material with MCODE as M003.

(iv) To display material wise highest and lowest price of dresses from DRESS table.

(Display MCODE of each dress along with highest and lowest price)

(v) `SELECT SUM (PRICE) FROM DRESS WHERE MCODE='M001';`

(vi) `SELECT DESCRIPTION, TYPE FROM DRESS, MATERIAL WHERE DRESS.DCODE=MATERIAL. MCODE AND DRESS. PRICE >= 1250;`

(vii) `SELECT MCODE, SUM(PRICE) FROM DRESS GROUP BY MCODE HAVING COUNT(*) > 2;`

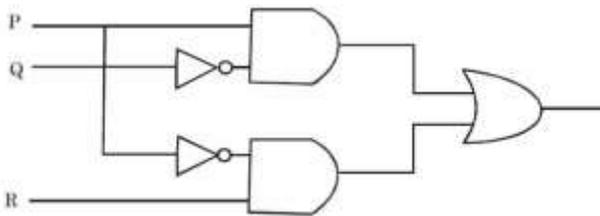
(viii) `SELECT COUNT (DISTINCT PRICE) FROM DRESS;`

6. (a) State and verify Absorption law algebraically.

2

(b) Write the equivalent Boolean Expression of the following Logic Circuit:

2



(c) Write the POS form of a Boolean function G, which is represented in a truth table 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	1

(d) Obtain a simplified form for a Boolean expression:

$$F(U, V, W, Z) = \Pi(0, 1, 3, 5, 6, 7, 15)$$

3

7. (a) Compare Message and Packet Switching Technique.

1

(b) Which of the following is not a Client Side script:

1

- (i) VB Script (ii) Java Script
(iii) ASP (iv) PHP

(c) Define the term Bandwidth. Give unit of Bandwidth.

1

(d) Write down the expansion of following:

- i) EDGE (ii) WLL

1

- (e) Name the protocol used for following tasks: 1
- i.) Used to transfer voice using packet switched network
 - ii) Used for chatting between 2 groups or between 2 individuals.

(f) Give two major reasons to have network security. 1

(g) ABC organization 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:



Center to center distances between various blocks

Block 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

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

- (i) Suggest a cable layout of connections between the blocks. 1
- (ii) Suggest the most suitable place (i.e. block) to house the server of this organization with a suitable reason. 1
- (iii) Suggest the placement of the following devices with justification 1
 - (a) Repeater
 - (b) Hub/Switch
- (iv) 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? 1
