

KENDRIYA VIDYALAYA SANGATHAN, CHENNAI REGION

REVISION Examination 2013

COMPUTER SCIENCE (083)

CLASS – XII

Time Allowed: 3 Hours

ANSWER KEY

Maximum Marks: 70

Instructions:

- (i) **All** questions are compulsory.
- (ii) Programming Language : C++, SQL

1. (a) Differentiate between run time error and syntax error with the help of suitable example. 2

Run Time Error	Syntax Error
This type of error occurs during run time.	This type of error occurs during compile time if the rules of the language is violated.
e.g. divide by zero etc.	e.g. using a variable with out declaring
Code: void main() { int a,b,c; a=10;b=0; c=a/b; //run time error c =* b; //syntax error (=* is wrong) }	

- (b) Write the name of the header files for the following: 1
(i). delay() (ii). fabs()
(i) Dos.h (ii). Math.h

- (c) Rewrite the following program after removing the syntactical error(s) (if any). 2
Underline the correction.

```
#include<iostream.h>
structure SwimmingClub
{
    int mem number;
    char memname[20];
    char memtype[]="LIG";
};
void main()
{
```

```

SwimmingClub per1,per2;
cin<<"Member Number: ";
cin>>memnumber.per1;
cout<<"Member Nmae: ";
cin>>per1.membername;
per1.memtype="HIG";
per2=per1;
cin<<"Member Number: "<<per2.membernumber;
cin<<"Member Name: "<<per2.memname;
cin<<"Member Type: "<<per2.memtype;
}

```

```

#include<iostream.h>
#include<string.h>
struct SwimmingClub
{
    int memnumber;
    char memname[20];
    char memtype[20];
};
void main()
{
    SwimmingClub per1,per2;
    cout<<"Member Number: ";
    cin>>per1.memnumber;
    cout<<"Member Nmae: ";
    cin>>per1.membername;
    strcpy(per1.memtype,"HIG");
    per2=per1;
    cout<<"Member Number: "<<per2.membernumber;
    cout<<"Member Name: "<<per2.memname;
    cout<<"Member Type: "<<per2.memtype;
}

```

(d) Write the output of the following code:

2

```

#include<iostream.h>
int global = 10;
void callme(int &x, int y)
{
    x -= y;
    y = x * 10;
    cout<<x<<': '<<y<<endl;
}
void main()

```

```

{
    int global = 7;
    callme(::global,global);
    cout<<global<<' '<<::global<<endl;
    callme(global,::global);
    cout<<global<<' '<<::global<<endl;
}
3:30
7:3
4:40
4:3

```

(e) Write the output of the following code:

3

```

#include<iostream.h>
void pass(int *ptr)
{
    for(int *pt=ptr ; pt<ptr+2 ;pt++)
        cout<<*pt<<'-' ;
        cout<<endl;
}
void main()
{
    int box = {10,33,17,12,20};
    pass(box);
    pass(box+1);
    pass(&box[2]);
}
10-33-
33-17-
17-12-

```

(f) In the following program what is the expected value of myscore from options (i) to (iv). Justify your answer.

2

```

#include<iostream.h>
#include<stdlib.h>
void main()
{
    randomize();
    int score[]={25,20,34,56,72,63},myscore;
    myscore=score[2+random(2)];
    cout<<myscore<<endl;
}

```

(i) 25 (ii) 34 (iii) 20 (iv) None

(ii) 34

Because [2+random(2)] can be either 2 or 3, which is used as index so the value of myscore can be from index 2 or 3, i.e. can be 34 or 56. Out of these

the option 34 is given in option (ii).

2. (a) Differentiate between abstract class and concrete class.

2

Abstract class	Concrete class
A class which is not meant for creating its object, but which serves as base class for other classes is called as abstract class.	A class which can serve for both i.e. object can be created and it may serve as base class also is called as concrete class.
It must contain abstract functions which are not defined but just declared. The definition of those functions is provided by their subclass.	It must define all its functions. i.e. no function should be abstract.

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

2

```
class mammal{
    public:
        char category[20];
        mammal( char xname[])           // function1
        {
            strcpy(category, xname)
        }
        mammal(mammal &t);               //function2
};
```

(i) Create an object, such that it invokes function1.

(ii). Write complete definition for function2.

```
(i) mammal ob("mammal 1");
(ii). mammal::mammal(mammal &t)
    {
        strcpy(category, t.category);
    }
```

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

4

Private Members:

- PlanCode of type long
- Place of type string
- NOT(No_of_Travellers) of type integer
- NOB(No of Buses) of type integer

Public Members:

- A constructor to assign initial values of PlanCode as 1001, Place as "Agra", NOT as 5, NOB as 1
- A function NewPlan() which allows users to enter PlanCode, Place and NOT. The function assigns the value of NOB as per the following conditions:

Number of Travellers	Number of Buses
Less than 20	1
Equal to or more than 20 and less than 40	2
Equal to 40 or more than 40	3

A function ShowPlan() to display the content of all the data members.

```
class TravelPlan
{
    private:
        long PlanCode;
        char Place[30];
        int NOT;
        int NOB;
    public:
        TravelPlan()
        {
            PlanCode=1001;
            strcpy(Place,"Agra");
            Not=5;
            NOB=1;
        }
        void NewPlan()
        {
            cout<<"Enter Plan Code: ";
            cin>>PlanCode;
            cout<<"Enter Place: ";
            gets(Place);
            cout<<"Enter Number of Travellers: ";
            cin>>NOT;
            if(NOT<20)
                NOB=1;
            else if(NOT<40)
                NOB=2;
            else
                NOB=3;
        }
        void ShowPlan()
        {
            cout<<"Plan Code: "<<PlanCode<<endl;
            cout<<"Place: "<<Place<<endl;
            cout<<"Number of Travellers: "<<NOT<<endl;
            cout<<"Number of Bus: "<<NOB<<endl;
        }
};
```

(d) Consider the following declarations and answer the questions given below:

4

```
class parent
{
    char name[20];
protected:
    int son;
public:
    void inputdata(char, int);
    void outputdata();
};
```

```

class father : protected parent
{
    int daughter;
protected :
    int baby;
public :
    void readdata(int, int);
    void writedata();
};
class mother : private father
{
int X;
public : void fetchdata (int);
void displaydata();
};

```

- (i) Name the base class and derived class of the class father.
- (ii) Name the data members that can be accessed from function display data();
Name the member function which can be accessed by an object of mother class.
- (iv) Is the member function outputdata() accessible to the object of father class?

(i).Base class= parent

Derived Class=mother

(ii). X, baby, son

(iii). Fetchdata(), displaydata()

(iv). No

3. (a) Write a function in C++ two input int arrays arranged in ascending order and their sizes as arguments and one output array and an output variable for the size of result array as arguments and it merges both the input arrays in output array such that the output array is in ascending order. If any element is common in both the input array only one copy of it will go in the output array. Define the function. 3

```

void merge(int a[],int b[], int c[], int sa, int sb, int &sc)
{
    int i=0,j=0,k=0;
    while(i<sa && j<sb)
    {
        if(a[i]<b[j])
        {
            c[k]=a[i];
            i++;k++;
        }
        else if(b[j]<a[i])
        {
            c[k]=b[j];
            j++;k++;
        }
        else
        {
            c[k]=a[i];
            i++;j++;k++;
        }
    }
}

```

```

        }
    }
    while(i<sa)
    {
        c[k]=a[i];
        i++;k++;
    }
    while(j<sb)
    {
        c[k]=b[j];
        j++;k++;
    }
    sc=k;
}

```

- (b) An array DATA[1..10][1..10] requires 4 bytes for each element. If the base address of the array is 1500, determine the location of DATA[4][5], when the array is row wise. 3

BA=1500

ES=4

Lower bound of row as well as col=1

Upper bound of row as well as col=10

Row size $R=U-L+1 = 10-1+1=10$

R=10

C=10

I=4

J=5

Address of DATA[i][j]=BA+ES*[C(i-Lr) + (j-Lc)]

&DATA[4][5] = 1500 + 4* [10(4-1) + (5-1)]

= 1500 + 4*34 = 1500+136=1636

- (c) Define(write code of) two important function of dynamic stack containing names of cities. 4

```

struct node
{
    char city[30];
    node *link;
}*top=NULL,*temp,*newnode;
void push()
{
    newnode=new node;
    if(newnode==NULL)
    {
        cout<<"Overflow";
        return;
    }
}

```

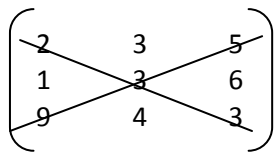
```

    }
    cout<<"Enter city name: ";
    gets(newnode->city);
    newnode->link=top;
    top=newnode;
}
void pop()
{
    if(top==NULL)
    {
        cout<<"Underflow";
        return;
    }
    temp=top;
    cout<<"City name: "<<temp->city<<" deleted from stack.";
    top=temp->link;
    delete (temp);
}

```

- (d) Write a C++ function to print both the diagonal of a square matrix. E.g.

Then the output should be:



Diagonal 1: 2 3 3
 Diagonal 2: 5 3 9

```

void diag(int a[][30], int r, int c)
{
    if(r!=c)
    {
        cout<<"Diagonal not possible.";
        return;
    }
    int i,j;
    cout<<"Diagonal 1: ";
    for(i=0;i<r;i++)
        cout<<a[i][i]<<" ";
    cout<<"\nDiagonal 2: ";
    for(i=0,j=c-1;i<r;i++,j--)
        cout<a[i][j];
}

```

- (e) Evaluate the following postfix expression using a stack and show the contents of the stack after each operation. 2
 100, 40, 8, +, 20, 10, -, +, *

Element	Operation	Stack
100	Push	100
40	Push	100, 40
8	Push	100, 40, 8
+	Pop: 8 & 40 40+8=48 Push 48	100, 48
20	Push	100, 48, 20
10	Push	100, 48, 20, 10
-	Pop 10 & 20 20-10=10 Push 10	100, 48, 10
+	Pop 10 & 48 48+10=58 Push 58	100, 58
*	Pop 58 & 100 100*58=5800 Push 5800	5800

Ans = 5800

4. (a) Given the following code:

```
#include<fstream.h>
#include<conio.h>
void main()
{ ifstream fin;
  clrscr();
  fin.open("a.txt",ios::in);
  int size=0;
  ..... // statement 1
  size=..... ; //statement 2
  cout<<size;
  fin.close();
  getch();
}
```

Write statement 1 and statement 2 using seek..() and tell..() so that it calculate the file size.

```
Fin.seekg(0,ios::end);
Size=fin.tellg();
```

- (b) Write a function in C++ which opens a text file sample.txt and count the number of lines present in the file and displays it.

```
void counting()
{
    ifstream fin;
```

```

    fin.open("sample.txt",ios::in);
    if(!fin)
    {
        cout<<"file not opened.";
        return;
    }
    int count=0;
    char str[80];
    while(fin)
    {
        fin.getline(str,80,'\n');
        count++;
    }
    fin.close();
    cout<<"Number of lines = "<<count;
}

```

```

(c) class book
{
int book_no;
char book_name[20];
float price;
public:
void enter_book_Details( )
{
cin>> book_no>> price; gets(book_name);
}
void show_book_Details( );
int checkbookno(int bookno)
{
If(book_no==bookno)
Return(0);
Else
Return (1);
};

```

Write a function deleteBook() in C++ that deletes the required book record from the binary file BOOKS.DAT based on book_no.

```

void deleteBook(int bookNoToDelete)
{
    ifstream fin;
    ofstream fout;
    book ob;
    fin.open("BOOKS.DAT",ios::in|ios::binary);
    fout.open("temp.dat",ios::out|ios::binary);
    if(!fin||!fout)
    {
        cout<<"File not opened.";
    }
}

```

```

        getch();
        return;
    }
    while(fin.read((char*)&ob,sizeof(ob)))
    {
        if(ob.checkbookno(bookNoToDelete)==1)
            fout.write((char*)&ob,sizeof(ob));
    }
    fin.close();
    fout.close();
    remove("BOOKS.DAT");
    rename("temp.dat","BOOKS.DAT");
}

```

5. (a) Differentiate between DDL & DML. Also give example.

2

DDL	DML
Data definition language commands are related to the structure of the table.	Data manipulation commands are related to the manipulation of data in the table.
e.g. create table, alter table, drop table	e.g. insert, update, delete, select
It cannot be rollback.	It can be rollback.

(b) Consider the following tables Product and Client. Write SQL commands for the statement (i) to (iv) and give outputs for SQL queries (v) to (viii).

6

TABLE: Product

P_ID	ProductName	Manufacturer	Price
TP01	Talcom Powder	LAK	40
FW05	Face Wash	ABC	45
BS01	Bath Soap	ABC	55
SH06	Shampoo	XYZ	120
FW12	Face Wash	XYZ	95

TABLE: Client

C_ID	ClientName	City	P_ID
01	Cosmetic Shop	Delhi	FW05
06	Total Health	Mumbai	BS01
12	Live Life	Delhi	SH06
15	Pretty Woman	Delhi	FW12
16	Dreams	Bangalore	TP01

(i) To display the details of those Clients whose City is Delhi.

```
SELECT * FROM CLIENT WHERE CITY='DELHI';
```

(ii) To Display the details of Products whose Price is in the range of 50 to 100(Both values included).

```
SELECT * FROM PRODUCT WHERE PRICE BETWEEN 50 AND 100;
```

(iii) To Display the ClientName, City from table Client and ProductName and Price from table Product, with their corresponding matching P_ID.

```
SELECT CLIENTNAME, CITY, PRODUCTNAME, PRICE
FROM CLIENT C, PRODUCT P
WHERE C.P_ID=P.P_ID ;
```

- (iv) To increase the Price of all Products by 10.
 UPDATE PRODUCT SET PRICE = PRICE + 10 ;
- (v) SELECT DISTINCT (City) FROM Client;
 DELHI
 MUMBAI
 BANGALORE
- (vi) SELECT Manufacturer, MAX(Price), MIN(Price), COUNT(*)
 FROM Product GROUP BY Manufacturer;
 LAK 40 40 1
 ABC 55 45 2
 XYZ 120 95 2
- (vii) SELECT ClientName, Manufacturer FROM Product, Client
 WHERE Client.P_ID=Product.P_ID;

Cosmetic Shop	ABC
Total Health	ABC
Live Life	XYZ
Pretty Woman	XYZ
Dreams	LAK

- (viii) SELECT ProductName, Price*4 FROM Product;

Talcom Powder	160
Face Wash	180
Bath Soap	220
Shampoo	480
Face Wash	380

- (c) Write SQL commands for the following: 2
- (i). To delete all the records from table Employee;
 DELETE FROM EMPLOYEE;
- (ii). To add primary key constraint to rollno column in an existing table student.
 ALTER TABLE STUDENT ADD PRIMARY KEY(ROLLNO);

6. (a) Explain principle of duality with the help of example. 2

It says that if a Boolean expression is true then we can derive its dual which is also true.

To write the dual of expression convert + to .(dot), convert .(dot) to +, convert 0 to 1 & convert 1 to 0.

e.g. if $x+0 = x$

then its dual is $x.1 = x$ which is also true.

- (b) Write the SOP expression for the following truth table: 1

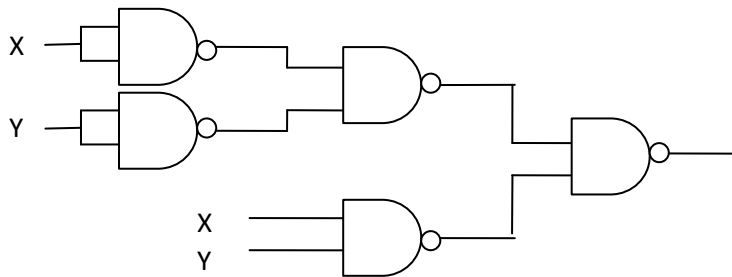
X	Y	Z	F(output)
0	0	0	0

0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

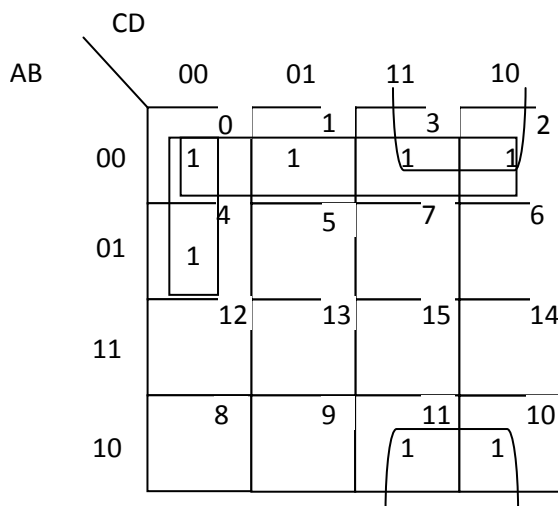
$$F = X'Y'Z + X'YZ' + XY'Z' + XYZ$$

- (c) Draw the logical circuit for the following boolean expression using only NAND gates: $F(x,y) = x'.y' + x.y$ 2

$$\begin{aligned}
 F &= \overline{X} \overline{Y} + XY \\
 &= \overline{\overline{\overline{X} \overline{Y}} + \overline{XY}} \\
 &= \overline{\overline{X} \overline{Y} . XY}
 \end{aligned}$$



- (d) Reduce the following boolean expression using K-Map: 3
 $F(a,b,c,d) = m_0 + m_1 + m_2 + m_3 + m_4 + m_{10} + m_{11}$

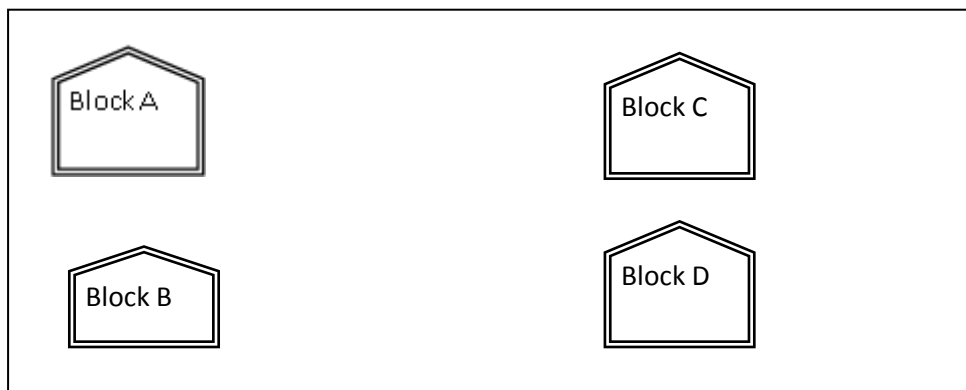


$$F = A'B' + A'C'D' + B'C$$

7. (a) What do you mean by Open Source Software? 1

Open source software is a free software whose source code is open/free to modify, redistribute.

- (b) What is PAN? 1
 PAN is Personal Area Network which is a small temporary network which connects the devices like cell phones, laptops, palmtops etc using Bluetooth or infrared technology for the purpose of sharing the data.
- (c) What is firewall? 1
 It is a software which blocks unauthorized access and prevents computer from misuse.
- (d) Which protocol is used for transferring files from one computer to another? 1
 FTP
- (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



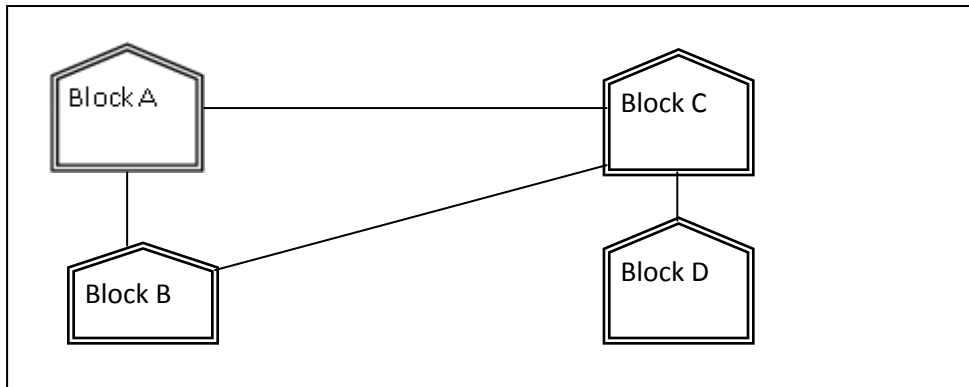
Center to center distances between various blocks

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.



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

Block C because it is having maximum number of computers so according to 80:20 rule the overall traffic gets reduced.

- iii. Suggest the placement of the following devices with justification

- (i) Repeater
- (ii) Hub/Switch

Repeater may be placed between A to C and B to C as the distance is long.

Hub/Switch is required in each block to connect the computers together.

- 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?

Radio wave