

KENDRIYA VIDYALAYA SANGATHAN- ERNAKULAM REGION
MODEL PAPER - CLASS XII
COMPUTER SCIENCE (083)

Time allowed: 3Hrs

Maximum Marks :70

Instructions:

- i) All the questions are compulsory*
- ii) Programming Language C++*

1.

(a) When will you make function inline and why **2**

(b) Write the names of the header files which are necessary to execute the following C++ code **1**

```
void main()
{
    char c, String[ ] = " System Design ";
    for(int i=0; String[i]!='\0' ;i++)
        if(String[i] == ' ')
            cout<<endl;
        else
        {
            c=toupper(String[i]);
            cout<<c;
        }
}
```

(c) Rewrite the following program after removing the syntactical error(s), if any. Under line each correction. **2**

```
#include<iostream.h>
#include<stdio.h>
void main()
{
    struct emp
    {
        char emp_name[15];
        char emp_no;
        int salary = 5000;
    }EMPLOYEE;
    gets(emp_name);
    gets(emp_no);
}
```

(d) Find the output of the following program **3**

```
#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

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";
}

```

(f). Find the correct possible out put(s)

2

```

#include<stdlib.h>
#include<iostream.h>
void main()
{
    randomize();
    char city[ ]={"PKD", "EKM", "TVM", "KOL", "CAL"};
    int ZEN;
    for(int i=0;i<3;i++);
    {
        ZEN=random(2)+1;
        cout<<city[ZEN]<<"@";
    }
}

```

- (i) PKD@ EKM @TVM@
- (ii) EKM @TVM@ EKM @
- (iii) TVM@KOL@CAL@
- (iv) TVM@ EKM @TVM@

2.

(a).What do you mean by a temporary instance of a class ? What is its use? how is it created?

2

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

2

```
class School
{
    int score;
    public:
        School(int y)                //Constructor 1
        {
            score=y;
        }
        School(School & t)           //Constructor2
};
```

(i) Create an object, such that it invokes Constructor 1.

(ii) Write complete definition for Constructor 2.

(c) Define a class BOOK with the following specifications.

4

Private members

BOOK_NO	integer type
BOOK_TITLE	20 Characters
PRICE	float(price per copy)
TOTAL_COST()	A function to calculate the total cost for N number of copies, Where N is passed to the function as argument

Public members

INPUT()	Function to read BOO_NO, BOOK_TITLE, PRICE
PURCHASE()	Function to ask the user to input the number of copies to be purchased. It invokes TOTAL_COST() and prints the total cost to be paid by the user.

Note: You are also required to give detailed function definitions.

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

4

```
class book
{
    char Title[2];
    char author[20];
    int no-of_pages;
public:
    void read();
    void show();
};

class textbook : private book
{
    int no_of_chapters, no_of_assignments;
protected:
    int standard;
public:
    void readtextbook();
    void showtextbook();
};

class Physicsbook : public Textbook
{
```

```

        char Topic[20];
public:
        void readphysicsbook();
        void showphysicsbook();
};

```

- (i) Name the members, which can be accessed from the member functions of class Physicsbook.
- (ii) Name the members, which can be accessed by an object of class Textbook.
- (iii) Name the members, which can be accessed by an object of class Physicsbook.
- (iv) What will be the size of an object(in bytes) of class physics book?.

3.

(a)

3

Write a function **Get1from2()** function in C++ to transfer the content from two arrays First[] and Second[] to array All[]. The even places (0,2,4,...) of array All[] should get the contents from the array First[] and odd places (1,3,5,...)of the array All[] should get the contents from the array Second[]

Eg:

If the First [] array contains 30, 60,90,
And the Second [] array contains 10, 50,80,
Then All [] array should contain 30, 10, 60,50,90,80.

(b)

3

An array Array[20][15] is stored in the memory along with column with each element occupying 8 bytes. Find out the base address and address of the element Array[2][3] if the element Array[4][5] is stored at the address 1000

(c)

4

Write a function in C++ to insert an element into a dynamically allocated queue where each node contains a name (of type string) as data.

Assume the following definition of MYNODE for the same
struct MYNODE

```

{
        chae name[25];
        MYNODE *Link;
};

```

(d)

2

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

[Assuming the 2D array to be square matrix with odd dimension i.e. 3*3, 5*5, 7*7 etc....]

Eg: 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

(e) Evaluate the following postfix notation of expression: 20,60,+,20,10,-,*

2

4.

(a). Observe the program segment carefully and fill in the blanks marked as statement 1 & 2

1

```
#include<fstream.h>
```

```
class MATERIAL
```

```
{
```

```
    int Mno; char Mname[25]; int qty;
```

```
public:
```

```
    :
```

```
    void ModifyQty();
```

```
};
```

```
void MATERIAL::ModifyQty()
```

```
{
```

```
    Fstream File;
```

```
    File.open("MATERIAL.DAT", ios::binary | ios::in | ios::out);
```

```
    int Mpno;
```

```
    cout << "Material no to modify Qty : "; cin >> Mpno;
```

```
    while (File.read((char*)this, sizeof(MATERIAL)))
```

```
    {
```

```
        if (Mpno == Mno)
```

```
        {
```

```
            cout << "Present Qty : " << qty << endl;
```

```
            cout << "Changed Qty : "; cin >> qty;
```

```
            int Position = _____;
```

//(Statement 1)

```
            _____;
```

//(Statement 2)

```
            File.write((char * this, sizeof (MATERIAL))); // Re-writing the record
```

```
        }
```

```
    }
```

```
    File.close();
```

```
}
```

(b)

2

Write a function in C++ to print the count of the word as an independent word in a text file story.txt

Eg: There was a tiger in the zoo. The tiger was very naughty.

The output of the program should be 2.

(c)

3

Given a binary file Sports.dat, containing records of the following structure type:

```
Struct Sports
```

```
{
```

```
    Char Event[20];
```

```
    Char Participant[10][30];
```

```
};
```

Write a function in C++ that would read contents from the file Sports .dat and creates a file named Athletic.dat copying only those records from Sports.dat where the event name is "Atheletics",

5.

(a)

2

What do you understand by the term alternate key and degree of a relation in a relational database?

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

EMPLOYEES

EMPID	FIRSTNAME	LASTNAME	ADDRESS	CITY
010	George	Smith	83 First Street	Howard
105	Mary	Jones	842 Vine Ave	Loasantiville
152	Sam	Tones	33 Elm St	Paris
215	Sarah	Acherman	440 US 110	Upton
244	Manila	Sengupta	24 Friends Street	New Delhi
300	Robert	Samuel	9 Fifth Cross	Washington
335	Henry	Williams	12 Moore Street	Boston
400	Rachel	Lee	121 Harrison St	New York
441	Peter	Thompson	11 Red Road	Paris

EMPLOYEES

EMPID	SALARY	BENEFITS	DESIGNATION
010	75000	15000	Manager
105	65000	15000	Manager
152	80000	25000	Director
215	75000	12500	Manager
244	50000	12000	Clerk
300	45000	10000	Clerk
335	40000	10000	Clerk
400	32000	7500	Salesman
441	28000	7500	Salesman

(i) To display Firstname, Lastname, address and city of all employees leaving in Paris from the table EMPLOYEES.

(ii) To display the content of EMPLOYEES table in descending order of Firstname.

(iii) To display the Firstname , Lastname, and total salary of all Managers from the tablesEMPLOYEES and EMPLOYEES, where total salary is calculated as SALARY + BENEFITS

(iv) To display the maximum salary among Managers and Clerks from the table EMPLOYEES.

(v) SELECT FIRSTNAME,SALARY FROM EMPLOYEES, EMPLOYEES WHERE DESIGNATION = 'Salesman' AND EMPLOYEES.EMPID =EMPLOYEES.EMPID;

(vi) SELECT COUNT(DISTINCT DESIGNATION) FROM EMPLOYEES;

(vii) SELECT DESIGNATION,SUM(SALARY) FROM EMPLOYEES GROUP BY DESIGNATION HAVING COUNT(*)>2;

(viii) SELECT SUM(BENEFITS) FROM EMPLOYEES WHERE DESIGNATION='Clerk';

6.

(a) Verify the law using truth table $X+(Y+Z) = (X+Y)+Z$ 2

(b) Draw the logic circuit for $F=AB' + CD'$ 2

(c) Derive the **POS** form of Boolean expression from the given truth table. 1

A	B	C	F(A B C)
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

(d) Reduce the following Boolean expression using K map 3

$$F(M,N,O,P) = \sum(0,1,3,4,5,6,7,9,10,11,13,15)$$

7.

(a) What are hubs? Explain about the categories. 1

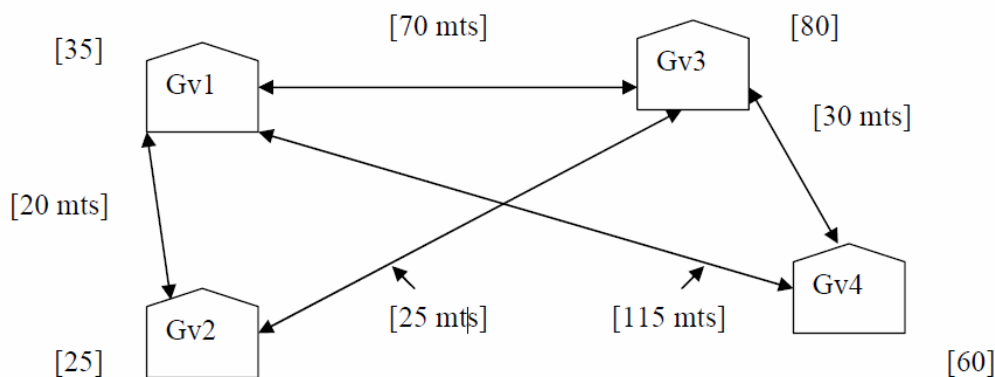
(b) What is 80 - 20 rule in networking 1

(c) Expand GSM, CDMA 1

(d) How is Hacker different from Cracker? 1

(e) What is Telnet ? What does it do? 1

(f) TCS has the following buildings in their Bangalore campus 5



[] – Shows computers in each building

-->Shows distance

Computers in each building are networked but buildings are not networked so far. The company has now decided to connect building also.

(i) Suggest a cable layout for these buildings

(ii) In each of the buildings, the management wants that each LAN segment gets a dedicated bandwidth i.e bandwidth must not be shared. How can this be achieved?

(iii) The company also wants to make available shared Internet access for each of the buildings. How can this be achieved?

(iv) The company wants to link its head office in GV1 building to its another office in Japan.

(a) Which type of transmission medium is appropriate for such a link?

(b) What type of network would this connection result into?

(vi) Where server & modem to be installed? why?

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