MODEL QUESTION PAPER - 2010
COMPUTER SCIENCE
XII

Time: 3 hrs
Marks:70

GENERAL INSTRUCTIONS:
1.   All the questions are compulsory.
2.   Programming language: C+ +

1.

a)   Differentiate between overloaded functions and function with default
        arguments. Also give suitable example in C++.   (2)

b)   Name the header file required for successful compilation of the
        given snippet:
         main( )
        {   char str[20]="Exam";
                cout<<setw(20)<<str;
                return 0;
        }   (1)

c) Rewrite the following program after removing all the syntactical errors underlining
    each correction. (if any) :   (2)
                include<iostream.h>
                struct
                { int x=10;
                float y;
                }A,*p;
                void main( )
                {
                        p=A;
                        cout<<"\nInput Integer : ";
                        cin>>p.x;
                        cout<<"\nInput any number : ";
                        cin>>A.y;
                }

d)   What will be the out put of the following program?   (2)
        #include <iostream.h>

        void RIDDLE(int *N,int c)

        {   for(int i=1;i<c;i++)

                        (N+i-1)=(N+i)+1;

        }

        void main()

        {

                int p[ ] = {6,9,8},q[ ]={4,3,1},r[]={50,80};

                clrscr();

```
                RIDDLE(p,3);
                RIDDLE(q,3);
                RIDDLE(r,2);
                for(inti=0;i<3;i++)
                        cout<<p[i]<<'-';
                        cout<<endl;
                for(i=0;i<3;i++)
                        cout<<q[i]<<'%';
                        cout<<endl;
                for(i=0;i<2;i++)
                        cout<<r[i]<<'-';
                        cout<<endl;
        }
```

e)   What will be the output of the following program :   (3)

```
    #include<iostream.h>
    void Modify(int &a, int b=10)
    {
            if(b%10==0)
                    a+=5;
            for(int i=5;i<=a;i++)
                    cout<<b++<<':';
            cout<<endl;
     }
    void Disp(int x)
    {
             if(x%3==0)
                    Modify(x);
            else
                    Modify(x,3);
    }
    void main()
    {       Disp(3);
            Disp(4);
            Modify(2,20);
    }
```

(f)   In the following program, find the correct possible output(s)
       from the options :   (2)

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

```
#include<stdlib.h>

void main( )
{
        randomize( );
        int p=99,q=999;
        int x=random(3)+4;
        int y=random(2)+2;
        for(int i=0;i<x;i++)
        cout<<'#';
        cout<<p<<'-';
        for(i=0;i<y;i++)
        cout<<'@';
        cout<<q<<endl;
}
```

i)   ##99-@999
ii)   ##99-@@999
iii)   ######99-@@999
iv)   ####99-@@@999

2.   a)   Do Inheritance and containership mean the same? What are the similarities
          and difference between the two?   (2)
     b)   Answer the questions (i) and (ii) after going through the following class: (2)

```
class Factory
{ private:
        char Name[30];
        int worker;
        public:
         Factory( )                             //function 1
        {       strcpy(Name,"Blank");
                worker=0;
        }
        void Details( )                         //function 2
        {       cout<<Name<<endl<<worker<<endl; }
        Factory(char *Fact_name, int No);       //function 3
        Factory(Factory &F);                    // function 4
};
```

   i) In OOP, what is function 4 referred as? Also write a statement which
       will invoke this function?
   ii) In OOP, which concept is illustrated by function 1, function 3 & function 4
       together?

     c)   Define a class Computer in C++ with following description: (4)
          Private Members:
              ▪   Processor _speed
              ▪   Price
              ▪   Processor_type

Public Members:
- A constructor to initialize the data members.
- A function cpu_input() to enter value of processor_speed.

- A function void setcostANDtype( ) to change the speed of the processor and also find the cost and type depending on the speed:

Processor_speed	Price	Processor_type
4000 MHz	Rs 30000	C2D
<4000 & >=2000	Rs 25000	PIV
< 2000	Rs 20000	Celeron

- A function cpu_output() to display values of all the data members.

d) Consider the following declarations and answer the questions given below   (4)

```
class Goods
{
        int id;
        protected :
        char name[20];
        long qty;
        void Incr(int n);
        public :
        Goods();
        ~Goods();
        void get();
};
class Food_products : protected Goods
{
        char exp_dt[10];
        protected :
        int id;
        int qty;
        public :
        void getd();
        void showd();
};
class Cosmetics : private Goods
{
        int qty;
        char exp_date[10];
        protected :
        int id;
        public :
        ~Cosmetics();
        Cosmetics();
        void show();
};
```

i)   Name the all protected members of class Food_products.

ii) Name the member functions accessible through the object of class Food_products.

iii) From the following, Identify the member function(s) that cannot be called directly from the object of class Cosmetics
  show()
  getd()
  get()

iv) If the class cosmetics inherit the properties of food_products class also, then name the type of inheritance.

3. a) Write a function FIBSORT( ), to find whether the given integer array arr[10] is sorted in ascending order or descending order or not in order. The function should return 'A' for ascending order, 'D' for descending order and 'N' for no order. (3)

b) An array PP[20][25] is stored in the memory along the row with each of the elements occupying 4 bytes. Find out the memory location for the element PP[13][20], if the element PP[7][10] is stored at memory location 3454. (3)

c) Write a function to perform PUSH operation in a dynamically allocated stack containing name and registration number of students. Also declare the relevant structure/class and pointers. (4)

d) Write a function to print the product of each row of a two dimensional integer array passed as the argument of the function .
  Ex. If the two dimensional array contains :

2	4	10
4	5	20
6	3	30

  Then the output should appear as :
  Product of row 1 = 80
  Product of row 2 = 400
  Product of row 3 = 540 (2)

e) Convert the following infix expression to its equivalent postfix expression (2) showing stack status for the conversions :
  A + B * (C-D) /E

4. (a) Observe the following program segment given below carefully fill the blanks marked as Statement1 and Statement2 using seekg()and tellg( )functions for performing the requested task: (1)

```
class Railway
{
        int Tno,
        char Tname[20];
public:
        // Function1 to count total number of records.
```

```
                    int CountRec( );
            };


            int Railway :: CountRec( )
            {
                    fstream File;
                    File.open("Rail.Dat", ios::in | ios::binary);
                    ……………………………………………………..// Statement 1
                    int bytes =…………………………………………..// Statement 2
                    int count = bytes / sizeof(Item);
                    File.close( );
                    return count;
            }
```

(b)   Write a function in C++ to count and displays the articles 'a', 'an' and 'the'
        present in a text file ARTICLE.TXT.   (2)
        For Example:

        If the file contains:
        "He is Ram. He is a good boy. He studies in the class 12th. He has an
        elephant. The elephant is very strong animal."
        Then the output should be:
                Article 'a' = 1
                Article 'an'=1
                Article 'the'=2

(c)   How many file objects would you need to create to manage the following
        situations? Explain.   (1)

                i)   to process three files sequentially
                ii)   to merge two sorted files into a third file.

(d)   A file named "LOTTERY.DAT" is given to you with the following
        data in each record.   (3)

                i)   Lottery ticket number (1000 – 1000000)
                ii)   Name of the agent
                iii)   Name of the person who bought.

        Write a function Rand( ) to create a list of 5 random numbers in the range
        1000 to 1000000. Use the function in main( ) to print out the details about
        the person who is holding the ticket. The searching is done on the data file
        to retrieve the data.

5.

    a) What do you understand by the terms Primary key and Degree of a relation
        in relational database?   (2)

    b) Consider the following tables EMPLOYEES and EMPSALARY.

Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii)

EMPLOYEES

EMPID	FIRSTNAME	LASTNAME	ADDRESS	CITY
010	George	Smith	83 First Street	Howard
105	Mary	Jones	842 Vine Ave	Losantiville
152	Sam	Tones	33 Elm.St	Paris
215	Sarah	Ackerman	440 U.S 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

b)   EMPSALARY

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 First name, Last name, Address and city of all employees living in Paris from the table EMPLOYEES.   (1)

(ii)   To display the content of the EMPLOYEES table in descending order of FIRSTNAME.   (1)

(iii)   To display the Firstname , Lastname, and Total Salary of all Managers from the tables EMPLOYEES and EMPSALARY, where Total salary is calculated as Salary + Benefits.   (1)

(iv)   To display the maximum salary among Managers and clerk from the table EMPSALARY.   (1)

(v)   SELECT FIRSTNAME,SALARY FROM EMPLOYEES,EMPSALARY
         WHERE DESIGNATION = 'salesman" AND
        EMPLOYEES.EMPID = EMPSALARY.EMPID   (2)

(vi)   SELECT COUNT(DISTINCT DESIGNATION)FROM EMPSALARY;
(vii)   SELECT DESIGNATION,SUM(SALARY)

FROM EMPSALARY
GROUP BY DESIGNATION HAVING COUNT(*) > 2;

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

6. (a) State and verify distributive law in Boolean algebra.   2

    (b) Write the equivalent Boolean expression for the following Logic Circuit: 2
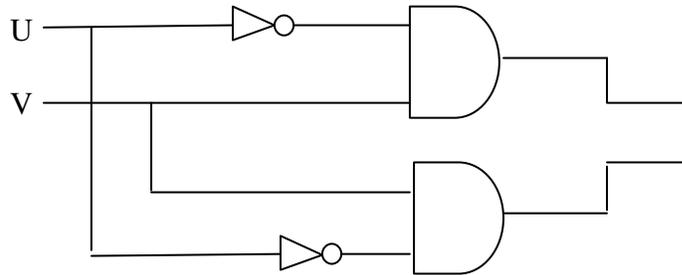
    (c) Write the SOP form of a Boolean function G, which is represented in a
         truth table as follows: 1

P	Q	R	$f(G)$
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0

    (d) Reduce the following Boolean expression using K-map: 3
         H(U, V, W, Z) = Σ (0, 1, 4, 5, 6, 7, 10, 11, 12, 13, 14, 15)

7. (a) Differentiate between routers and bridge.   1

    (b) Expands the following terms: 1
         (i) EDGE   (ii) XML

    (c) For what purpose Mozilla is used?   1

    (d) What is the function of TCP protocol?   1

    (e) Dr. Rizvi Education Society of India is starting its new CBSE School in
         Mumbai (Maharashtra). The society is already running a School in
         Jaunpur (UP) named Dr. Rizvi Learners' Academy, having 3 major buildings

in 2 km area campus. As a network expert you need to suggest the network plan as per E1 to E4:   4

| Mumbai CBSE School | Dr. Rizvi Learners' Academy Jaunpur | Library Building |
| | Acedemic Building | Admin Building |
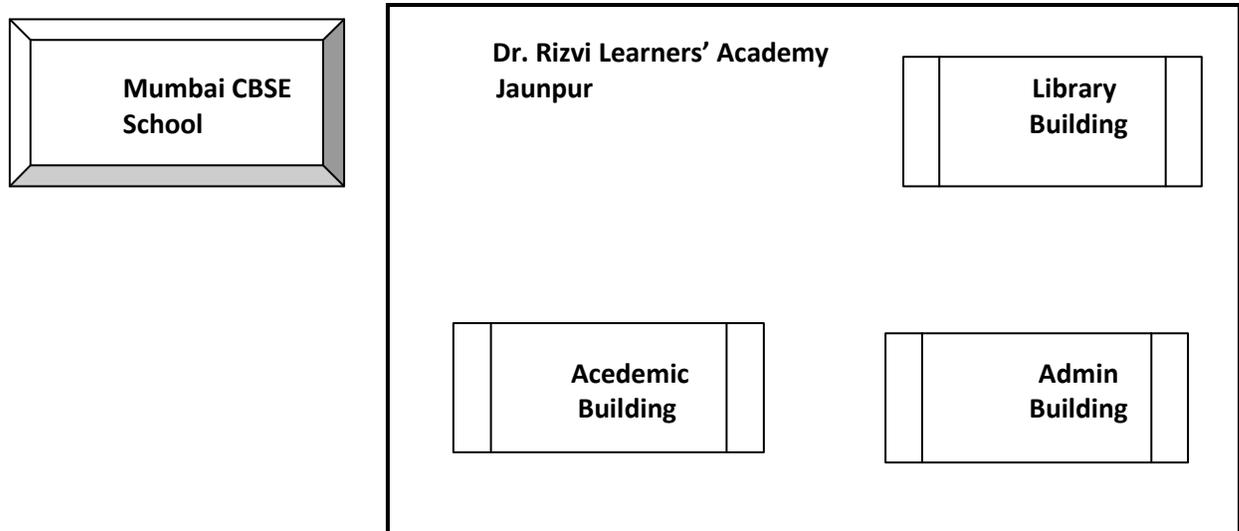
Wire Distance Between Various Buildings:

Library building to Admin building	90m
Library building to Academic building	80m
Academic building to Admin building	15m
Jaunpur School to Mumbai School	1350km

Expected number of Computers to be installed in various buildings:

Library Building	20
Academic building	150
Admin building	35
Mumbai School	5

E1.   Suggest the cable layout among various buildings inside school campus for connecting the buildings.
E2.   Suggest the most suitable place to house the server of the school with a suitable reason.
E3.   Suggest an efficient device from the following to be installed in each of the building to connect all the computers:
                    (i) Bridge   (ii) Repeater   (iii) Switch
E4.   Suggest the most suitable service (very high speed) to provide data connectivity between Rizvi Learners' in Jaunpur and Mumbai CBSE School from the options:
                    (i)   Telephone line
                    (ii)   Dial-up connection

	(iii)	Leased line
	(iv)	Satellite connection
	(v)	Radio waves

(f)   What are cookies?   1
(g)   Mention any two advantages of open source software and proprietary software.   1

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