

SAMPLE PAPER 2008-09

CLASS-XII

Time allowed: 3 hr.

COMPUTER SCIENCE

MM: 70

- Programming Language c++.
- All questions are compulsory.
- Please check that this question paper contains 12 printed pages.
- Please check that this question paper contains 7 questions
- Please write down the serial number of the question before attempting it.

1. (a) “While implementing encapsulation, abstraction is also implemented”. Comment **2**

(b) Name the header file to which the following functions belong: **1**

(i) itoa()

(ii) getc()

(c) Rewrite the following program after removing the syntactical errors (if any). Underline each correction: **2**

```
class ABC
```

```
{    int x=10;
    float y;
    ABC() {y=10; }
    ~() {}
```

```
}
```

```
void main()
```

```
{
```

```
    ABC a1(10);
```

```
}
```

(d) Write the output of the following program : **3**

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

```
#include <string.h>
```

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

```
void swap(char &c1,char &c2)
```

```
{    char temp;
```

```
    temp=c1;
```

```
    c1=c2;
```

```
    c2=temp;
```

```

}
void update(char *str)
{
    int k,j,l1,l2;
    l1 = (strlen(str)+1)/2;
    l2=strlen(str);
    for(k=0,j=l1-1;k<j;k++,j--)
    {
        if(islower(str[k]))
            swap(str[k],str[j]);
    }
    for(k=l1,j=l2-1;k<j;k++,j--)
    {
        if(isupper(str[k]))
            swap(str[k],str[j]);
    }
}
void main()
{
    char data[100]={"bEsTOfLUck"};
    cout<<"Original Data : "<<data<<endl;
    update(data);
    cout<<"Updated Data "<<data;
}

```

(e) In the following program, find the correct possible output(s) from the options and justify your answer: 2

```

#include <iostream.h>
#include <stdlib.h>
#include <string.h>
struct card {   char suit[10];
                int digit;
            };
card* cards = new card[52]; // Allocate Memory
void createdeck()

```

```

{   char temp[][10] = {"Clubs","Spades","Diamonds","Hearts"};
    int i,m=0,cnt=1;
    for(i=1;i<=52;i++)
    {   strcpy(cards[i].suit,temp[m]);
        cards[i].digit=cnt;
        cnt++;
        if(i % 13 == 0)
            { m++;cnt=1; }
    }
}

card drawcard(int num)
{   int rndnum;
    randomize();
    rndnum = random(num)+1;
    return (cards[rndnum]);
}

void main()
{   createdeck();
    card c;
    c = drawcard(39);
    if(c.digit > 10 || c.digit == 1)
    {
        switch(c.digit)
        {   case 11:      cout<<"Jack of ";   break;
            case 12:      cout<<"Queen of ";  break;
            case 13:      cout<<"King of ";   break;
            case 1:       cout<<"Ace of ";
        }
    }
    else
        cout<<c.digit<<" of ";
    cout<<c.suit;
    delete[] cards;    //Deallocate memory
}

```

Outputs:

- i) Kind of Spades ii) Ace of Clubs
iii) Ace of Diamond iv) Queen of Hearts

(f) Give the output of the following program code:

2

```
#include <iostream.h>
struct Pixel
{
    int c,r;
};
void display(Pixel p)
{
    cout<<"Col "<<p.c<<" Row "<<p.r<<endl;
}
void main()
{
    Pixel x = {40,50}, y, z;
    z = x;
    x.c = x.c + 10;
    y = z;
    y.c = y.c + ;
    y.r = y.r + 20;
    z.c = z.c - 15;
    display(x);
    display(y);
    display(z);
}
```

2.(a) How does the visibility mode control the access of members in the derived class? Explain with example. 2

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

```
class player
{
    int health;
```

```

    int age;
public:
    player() { health=6; age=18 }           //Constructor1
    player(int s, int a) {health =s; age = a ; } //Constructor2
    player( player &p) { }                 //Constructor3
    ~player() { cout<<"Memory Deallocate"; } //Destructor
};
void main()
{
    player p1(7,24); //Statement1
    player p3 = p1; //Statement3
}

```

(i) When p3 object created specify which constructor invoked and why?

(ii) Write complete definition for Constructor3?

(c) Define a class Employee in C++ with the following specification:

4

Private Members:

- ename an array of char of size[50] (represent employee name)
- deptname an array of char of size[20] (represent department name)
- salary integer (represent total salary of an employee)
- bonus float
- CalBonus() This function calculate the total bonus given to an employee according to following conditions

Deptname	Bonus
Accounts	4 % of salary
HR	5% of salary
IT	2% of salary
Sales	3% of salary
Marketing	4% of salary

Public Members:

- Constructor to initialise ename and deptname to NULL and salary and bonus to 0.
- A function read_info to allow user to enter values for ename, deptname,salary & Call function CalBonus() to calculate the bonus of an employee.
- A Function disp_info() to allow user to view the content of all the data members.

(d) Consider the following code and answer the questions:

4

```
class typeA
{
    int x;
protected:
    int k1;
public:
    typeA(int m);
    void showtypeA();
};
class typeB : public typeA
{
    float p,q;
protected:
    int m1;
    void intitypeB();
public:
    typeB(float a, float b);
    void showtypeB();
};
class typeC : public typeA, private typeB
{
    int u,v;
public:
    typeC(int a, int b);
    void showtypeC();
};
```

- (i) How much byte does an object belonging to class typeC require?
 - (ii) Name the data member(s), which are accessible from the object(s) of class typeC.
 - (iii) Name the members, which can be accessed from the member functions of class typeC?
 - (iv) Is data member **k1** of typeB accessible to objects of class typeB?
- 3 (a) Given two arrays A and B. Array 'A' contains all the elements of 'B' but one more element

extra. Write a c++ function which accepts array A and B and its size as arguments/ parameters and find out the extra element in Array A. (Restriction: array elements are not in order) **3**

Example

If Array A is {14, 21, 5, 19, 8, 4, 23, 11}

and Array B is {23, 8, 19, 4, 14, 11, 5 }

Then output will be 5 (extra element in Array A)

(b) Write a function in C++ which accepts an integer array and its size as arguments/parameters and assigns the elements into a two dimensional array of integers in the following format. **3**

if the array is 9,8,7,6,5,4

if the array is 1, 2, 3

The resultant 2D array is given below

The resultant 2D array is given below

```
9 9 9 9 9 9
8 8 8 8 8 0
7 7 7 7 0 0
6 6 6 0 0 0
5 5 0 0 0 0
4 0 0 0 0 0
```

```
1 1 1
2 2 0
3 0 0
```

(c) Each element of an array DATA[10][10] requires 8 bytes of storage. If base address of array DATA is 2000, determine the location of DATA[4][5], when array is stored

(i) Row-wise. (ii) Column-wise **4**

(d) Write the function to perform push and pop operation on a dynamically allocated stack of customers implemented with the help of the following structure: **4**

struct employee

```
{
    int eno;
    char ename[20];
    employee *link;
};
```

(e) Evaluate the following postfix notation of expression: **2**

5, 11, -, 6, 8, +, 12, *, /

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

```
#include <iostream.h>
#include <fstream.h>
void main(void)
```

```

{
    char filename[] = "C:\\testfileio3.txt";
    fstream inputfile, outputfile;
    int length;
    char * buffer;
    // -----create, open and write data to file-----
    outputfile.open(filename, ios::out);
    // ----write some text-----
    outputfile<<"This is just line of text."<<endl;
    // -----close the output file-----
    outputfile.close();
    // ----opening and reading data from file----
    inputfile.open(filename, ios::in);
    cout<<"The "<<filename<<" file was opened successfully!\n";
    cout<<"\nMove the pointer to the end\n"
    <<"Then back to the beginning with\n"
    <<"10 offset. The pointer now at...\n"<<endl;
    // flush the stream buffer explicitly...
    cout<<flush;
    // get length of file move the get pointer to the end of the stream
    inputfile.seekg(0, ios::end);
    // This statement returns the current stream position.
    length = _____ //Statement1
    cout<<"length variable = "<<length<<"\n";
    // dynamically allocate some memory storage for type char...
    buffer = new char [length];
    // move back the pointer to the beginning with offset of 10
    _____ //Statement2
    // read data as block from input file...
    inputfile.read(buffer, length);
    cout<<buffer;
    // free up the allocated memory storage...
    delete [] buffer;
}

```



```

        inputfile.close();
    }

```

(b) Assume a text file “coordinate.txt” is already created. Using this file create a C++ function to count the number of words having first character capital.. 2

Example:

Do less Thinking and pay more attention to your heart. Do Less Acquiring and pay more Attention to what you already have. Do Less Complaining and pay more Attention to giving. Do Less criticizing and pay more Attention to Complementing. Do less talking and pay more attention to SILENCE.

Output will be : Total words are 16

(c) Given a binary file “TABLE.TXT”, containing the records of the following class type 3

```

class perdata
{
    int age;
    int weight;
    int height;
    char name[40];
public:
    void getdata() { cin>>age>>weight>>height>>name; }
    void showdata() { cout<<age<<” “<<weight<<” “<<height<<” “<<name<<endl; }
    int retage()
    {
        return age;
    }
};

```

Write a function in c++ that would read contents from the file **personal.dat** and creates a file named **eligible.dat** copying only those records from **personal.dat** having age >= 18.

5. (a) What are the various levels of data abstraction in a database system? 2

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

FACULTY 6

F_ID	Fname	Lname	Hire_date	Salary
102	Amit	Mishra	12-10-1998	12000
103	Nitin	Vyas	24-12-1994	8000
104	Rakshit	Soni	18-5-2001	14000

105	Rashmi	Malhotra	11-9-2004	11000
106	Sulekha	Srivastava	5-6-2006	10000
107	Niranjan	Kumar	26-8-1996	16000

COURSES

C_ID	F_ID	Cname	Fees
C21	102	Grid Computing	40000
C22	106	System Design	16000
C23	104	Computer Security	8000
C24	106	Human Biology	15000
C25	102	Computer Network	20000
C26	105	Visual Basic	6000
C27	107	Dreamweaver	4000

- (i) To display details of those Faculties whose salary is greater than 12000.
- (ii) To display the details of courses whose fees is in the range of 15000 to 50000 (both values included).
- (iii) To increase the fees of all courses by 500.
- (iv) To display details of those courses which are taught by 'Sulekha'.
- (v) Select COUNT(DISTINCT F_ID) from COURSES;
- (vi) Select MIN(Salary) from FACULTY,COURSES
where COURSES.C_ID = FACULTY.F_ID;
- (vii) Select SUM(Fees) from courses
Group By F_ID having count(*) > 1;
- (viii) Select Fname, Lname from FACULTY
Where Lname like "M%";

6. (a) State and verify Distributive law in Boolean Algebra. 2
- (b) Convert the following Boolean expression into its equivalent Canonical Product of Sum (POS) form. $PQR + PQ'R + PQ'R' + P'Q'R$ 2
- (c) Obtain a simplified form for a Boolean expression 2
 $F(a, b, c, d) = \prod (0, 1, 3, 4, 5, 6, 7, 9, 10, 11, 13, 15)$ using Karnaugh Map.
- (d) Represent the Boolean expression $A' \cdot (B+C)$ with the help of NOR gates only. 2

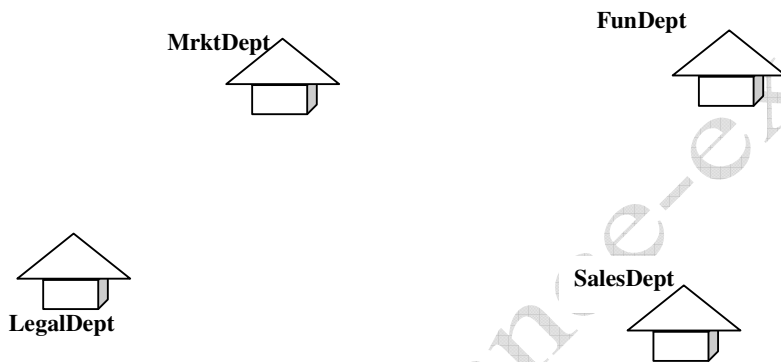
7. (a) What is gateway? 1

(b) Write the two advantages and two disadvantages of Bus Topology in Network? 1

(c) Expand the following terms with respect to Networking. 2

- i). PPP
- ii). SMTP
- iii). URL
- iv). FDMA

(d) SunRise Pvt. Ltd. is setting up the network in the Ahmedabad. There are four departments named as MrktDept, FunDept, LegalDept, SalesDept. 4



Distance between various buildings is as given:

MrktDept to FunDept	80 m
MrktDept to LegalDept	180m
MrktDept to SalesDept	100 m
LegalDept to SalesDept	150 m
LegalDept to FunDept	100 m
FunDept to SalesDept	50 m

Number of Computers in the buildings:

MrktDept	20
LegalDept	10

FunDept	08
SalesDept	42

- a) Suggest a cable layout of connections between the Departments and specify topology.
- b) Suggest the most suitable building to place the server a suitable reason with a suitable reason.
- c) Suggest the placement of Hub / Switch in the network.
- d) Name the Department to place the modem so that all the building can share internet connection.

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