

**Lakshmipat Singhania Public School: Jaykaypur**  
**Class: XII**  
**Sample Paper**  
**Computer Science**

Time: 3 hrs

FM 70

*General Instructions:*

(i) All questions are compulsory

(ii) Programming language : C++

1. a) Distinguish between function prototype and function definition in C++? 2
- b) Write the related library function name based upon the given information in C++. 1
  - i) Get single character using key board. This function is available in stdio.h file.
  - ii) To find out the square root of a number. This function is available in math.h file.
- c) Rewrite the following C++ program after removing all the syntactical errors(if any). Underline each correction. 2

```
#include<iostream.h>
CLASS User
{
    long UserId;
    char Gender;
    public:
        void Authorize
        {
            cin>>UserId>>Gender;
        }
        void Show()
        {
            cout<<UserId<<"."<<Gender<<endl;
        }
}
void main();
{
    User U;
    Authorize();
```

```
Show();  
}
```

d) Write the output of the following C++ program code:

2

```
#include<iostream.h>  
#include<conio.h>  
void main()  
{  
    char *s[]="BHUBANESHWAR";  
    int *ptr, res[]={1,4,9,16,25,36};  
    ptr=res;  
    cout<<"\nResult="<<*p<<" and string="<<s<<"\n";  
    ptr+=3;  
    s+=6;  
    cout<<"\nNow Result="<<*p<<" and string="<<s<<"\n";  
}
```

e) Find out the output of the following

3

```
#include<iostream.h>  
#include<conio.h>  
#include<ctype.h>  
classClass  
{  
    intCno,total;  
    char section;  
public:  
    Class(int no=1)  
    {  
        Cno=no;  
        section='A';  
        total=30;  
    }  
    voidadmission(int c=20)  
    {  
        section++;  
        total+=c;  
    }  
    voidClassShow()
```

```

    {
        cout<<Cno<<":"<<section<<":"<<total<<endl;
    }
};
void main()
{
    Class C1(5),C2;
    C1.admission(25);
    C1.ClassShow();
    C2.admission();
    C1.admission(30);
    C2.ClassShow();
    C1.ClassShow();
}

```

f) Study the following C++ program and select the possible output(s) from it :

Find the maximum and minimum value of L.

2

```

#include<stdlib.h>
#include<iostream.h>
#include<string.h>
void main()
{
    randomize();
    char P[]="SINGAPORE";
    long L;
    for(int i=0;P[i]!='R';i++)
    {
        L=random (sizeof(L)) +5;
        cout<<P[L]<<"-";
    }
}

```

- i) R-P-O-R-
- ii) P-O-R-+S
- iii) O-R-A-G-
- iv) A-G-R-N-

2. a) How abstraction and data hiding are implemented in C++? Explain with an example. 2

b) Answer the questions 1 and 2

2

class Stream

```
{
```

```

int StreamCode ;
char Streamname[20];
float fees;
public:
Stream( ) //Function 1
{
    StreamCode=1;
    strcpy (Streamname,"DELHI"); fees=1000;
}
void display(float C) //Function 2
{
    cout<<StreamCode<<":"<<Streamname<<":"<<fees<<endl;
}
~Stream( ) //Function 3
{
    cout<<"End of Stream Object"<<endl;
}
Stream (int SC,char S[ ],float F) ; //Function 4
};

```

i) In Object Oriented Programming, what are Function 1 and Function 4 combined together referred as? Write the definition of function 4.

ii) What is the difference between the following statements?

```

Stream Science(11,"Science",8700);
Stream Science=Stream(11,"Science",8700);

```

c) Define a class RESORT in C++ with the following descriptions: 4

Private Members:

```

Rno          //Data member to store room no
Name         //Data member to store customer name
Charges      //Data member to store per day charges
Days         //Data member to store number of days
COMPUTE()   //A function to calculate and return Amount as Days*Charges and
//if the value of Days*charges is more than 11000 then as 1.02*Days*Charges

```

Public Members:

```

Getinfo()    //A function to enter the content Rno, Name, Charges and Days
Dispinfo()   //A function to display Rno, Name, Charges, Days and Amount
//(Amount to be displayed by calling COMPUTE()).

```

d) Answer the questions (i) to (iv) based on the following code: 4

```

class AC

```

```
{
    char Model[10];
    char Date_of_purchase[10];
    char Company[20];
public( );
    AC( );
    void entercarddetail( );
    void showcarddetail( );
};
class Accessories : protected AC
{
    protected:
        char Stabilizer[30];
        char AC_cover[30];
    public:
        float Price;
        Accessories( );
        void enteraccessoriesdetails( );
        void showaccessoriesdetails( );
};
class Dealer : public Accessories
{
    int No_of_dealers;
    char dealers_name[20];
    int No_of_products;
    public:
        Dealer( );
        void enterdetails( );
        void showdetails( );
};
```

- (i) How many bytes will be required by an object of class Dealer and class Accessories?
- (ii) Which type of inheritance is illustrated in the above c++ code? Write the base class and derived class name of class Accessories.
- (iii) Write names of all the members which are accessible from the objects of class Dealer.
- (iv) Write names of all the members accessible from member functions of class Dealer.

3. a) An array  $T[-10..35][2..15]$  is stored in the memory along the row with each element occupying 4 bytes. Find out the base address and address of element  $T[20][5]$ , if an element  $T[2][2]$  is stored at the memory location 3000. Find the total number of elements stored in T and number of bytes allocated to T. 3
- b) Write a function `SORTSCORE()` in C++ to sort an array of structure ODI in ascending order of score using selection sort 3
- Note : Assume the following definition of structure ODI.
- ```
struct ODI
{
    int Score;
    char Teamname[20];
};
```
- c) Write member functions to perform **POP and PUSH** operations in a **dynamically allocated stack** containing the objects of the following structure: 4
- ```
struct GAME
{
    char Gamename[30];
    int numofplayer;
    Game *next;
};
```
- d) Write a function in C++ to print the sum of all the elements present on upper triangle of a two dimensional array passed as the argument to the function. 2
- e. Evaluate the following postfix expression. Show the status of stack after execution of each operation separately: 2
- 200, 80, 40, /, 20, 30, +, \*, -
4. a) Write the command to open a file named "Student". File stream object is File1. Give the command to open the file in both constructor method and `open()` 1
- b) Write a function in C++ to count and display vowels present in the file "VOWEL.TXT". 2
- Example:  
If the file contains:  
A girl is playing there. I love to eat pizza. A plane is in the sky.  
Then the output should be: 21
- c) Given the binary file Train.Dat, containing records of the following class CAR type: 3
- ```
class Train
{
    int T_No;
    char T_Name[20];
    float Speed;
```

```

public:
    void enter( )
    {
        cin>>T_No ;
        gets(T_Name) ;
        cin>>Speed;
    }
    void display( )
    {
        cout<<T_No ;
        cout<<T_Name ;
        cout<<Speed;
    }
    int RETURN_Speed( )
    {
        return Speed;
    }
};

```

Write a function in C++ that would read contents from the file Train.DAT and display the details of Train with speed between 150 to 200.

5. Define degree and cardinality. Based upon given table write degree and cardinality. 2

PATIENTS

| PatNo | PatName   | Dept  | DocID |
|-------|-----------|-------|-------|
| 1     | Leena     | ENT   | 100   |
| 2     | Surpreeth | Ortho | 200   |
| 3     | Madhu     | ENT   | 100   |
| 4     | Neha      | ENT   | 100   |
| 5     | Deepak    | Ortho | 200   |

b) Write SQL commands for the queries (i) to (iv) and output for (v) & (viii) based on a table COMPANY and CUSTOMER.

6

COMPANY

| CID | NAME       | CITY   | PRODUCTNAME |
|-----|------------|--------|-------------|
| 111 | SONY       | DELHI  | TV          |
| 222 | NOKIA      | MUMBAI | MOBILE      |
| 333 | ONIDA      | DELHI  | TV          |
| 444 | SONY       | MUMBAI | MOBILE      |
| 555 | BLACKBERRY | MADRAS | MOBILE      |

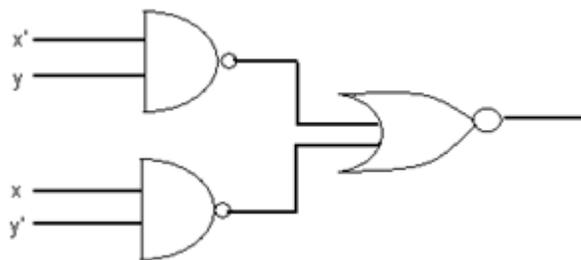
|     |      |       |        |
|-----|------|-------|--------|
| 666 | DELL | DELHI | LAPTOP |
|-----|------|-------|--------|

CUSTOMER

| CUSTID | NAME          | PRICE | QTY | CID |
|--------|---------------|-------|-----|-----|
| 101    | Rohan Sharma  | 70000 | 20  | 222 |
| 102    | Deepak Kumar  | 50000 | 10  | 666 |
| 103    | Mohan Kumar   | 30000 | 5   | 111 |
| 104    | SahilBansal   | 35000 | 3   | 33  |
| 105    | NehaSoni      | 25000 | 7   | 444 |
| 106    | SonalAggarwal | 20000 | 5   | 333 |
| 107    | Arjun Singh   | 50000 | 15  | 666 |

- (i) To display those company name which are having prize less than 30000.
- (ii) To display the name of the companies in reverse alphabetical order.
- (iii) To increase the prize by 1000 for those customer whose name starts with 'S'
- (iv) To add one more column totalprice with decimal(10,2) to the table customer
- (v) `SELECT COUNT(*) ,CITY FROM COMPANY GROUP BY CITY;`
- (vi) `SELECT MIN(PRICE), MAX(PRICE) FROM CUSTOMER WHERE QTY>10 ;`
- (vii) `SELECT AVG(QTY) FROM CUSTOMER WHERE NAME LIKE "%r%";`
- (viii) `SELECT PRODUCTNAME,CITY, PRICE FROM COMPANY,CUSTOMER WHERE COMPANY.CID=CUSTOMER.CID AND PRODUCTNAME="MOBILE";`

- 6. a) State and define principle of Duality. Why is it so important in Boolean Algebra? 2
- b) Write the equivalent boolean expression for the following logic circuit 2



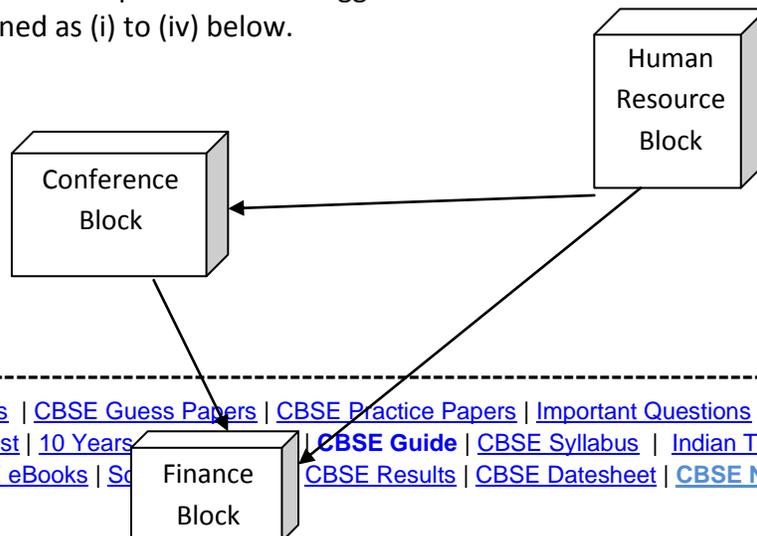
- c) Write Product Of Sum expression of the function F (a,b,c,d) from the given truth table 1

| a | b | C | d | F |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 1 | 0 | 1 |

|   |   |   |   |   |
|---|---|---|---|---|
| 0 | 0 | 1 | 1 | 1 |
| 0 | 1 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 0 |
| 0 | 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 | 1 |
| 1 | 0 | 0 | 1 | 0 |
| 1 | 0 | 1 | 0 | 1 |
| 1 | 0 | 1 | 1 | 1 |
| 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 0 | 1 | 1 |
| 1 | 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 |

- d) Obtain the minimal form for the following Boolean expression using Karnaugh’s Map. 3  
 $F(A,B,C,D) = \Sigma(1,3,4,5,6,7,12,13)$
7. a) Compare optical fiber and coaxial transmission media. 1  
 b) Name two transmission media for net working. 1  
 c) Differentiate between hacker and cracker. 1  
 d) Expand the following: 1  
     GPRS, Wi-Fi  
 e) Name two web sites which are prominent in social networking. 1  
 f) Write names of any two popular Open source software, which are used as operating systems. 1

g) Ignite Techno Corporation is a professional Consultancy company. The company is planning to set up their new offices in India with its hub at Rayagada. As a network expert adviser, you have to understand their requirement and suggest to them the best available solutions. Their queries are mentioned as (i) to (iv) below.



Block to block distance in mets

| Block (From)   | Block (To) | Distance |
|----------------|------------|----------|
| Human Resource | Conference | 60       |
| Human Resource | Finance    | 120      |
| Conference     | Finance    | 80       |

Expected Number of Computers to be installed in each block.

| Block          | Computers |
|----------------|-----------|
| Human Resource | 125       |
| Fincance       | 25        |
| Conference     | 60        |

- i) What will be most appropriate block to host server? 1
- ii) Draw a block to block cable layout to connect all the buildings in the most appropriate manner for efficient communication. 1
- iii) What will be the best possible connectivity out of the following, you will suggest to connect the new set up offices at Puri with its Tokyo based office? 1
  - Infrared
  - Satellite Link
  - Bluetooth
- iv) Which of the following device will be suggested by you to connect each computer in each of the following buildings? 1
  - Gateway
  - Switch
  - Modem