

**KENDRIYA VIDYALAYA SANGATHAN ERNAKULAM REGION**  
**SECOND PRE BOARD EXAMINATION 2018-19**  
**CLASS XII**  
**Sub: COMPUTER SCIENCE (083)**

**Time allowed: 3 Hours**

**Max. Marks: 70**

**General Instructions:**

- (a) *All questions are compulsory.*
- (b) *Programming Language : C++*
- (c) *In Question 2(b, d), 3 and 4 has internal choices.*

1 (a) Write the type of C++ Operators from the following: (2)  
(i) || (ii) \* (iii) == (iv) ?:

(b) Observe the following program very carefully and write the name of those header file(s), which are essentially needed to compile and execute the following program successfully: (1)

```
void main()
{
    char line[20], s;
    gets(line);
    s=toupper(line[0]);
    puts(line);
}
```

(c) Rewrite the following C++ code after removing any/all Syntactical Error(s) with each correction underlined. (2)

**Note: Assume all required header files are already being included in the program.**

```
#define MAX 100;
void main( )
{
    int num;
    cin>>num;
    if ( num>MAX)
        MAX=num;
    cout<<The largest number is:<<large;
}
```

- (d) Find the output of the following program. (3)

```
#include<iostream.h>
void main()
{
    int a[ ]={5,10,15,20,25,30};
    int *p=a+3;
    for(int i=0;i<3;i++)
    {
        p[i]=a[i];
        a[i]=p[i]*2;
    }
    for(i=0;i<6;i++)
    cout<<*(a+i)<<" ";
}
```

- (e) Find and write the output of the following C++ program code: (2)

```
typedef char STR[50];
void CHANGE(STR S)
{
    int Size=strlen(S); for(int
    I=0;I<Size;I+=1)
    {
        if(islower(S[I])
            S[I]=S[I]+1;
        else if(isupper(S[I])
            tolower(S[I]);
        else if(isdigit(S[I])
            if(S[I]==9 || S[I]%2==0)
                S[I]='#';
            else
                S[I]=S[I+1]
    }

void main()
{
    STR Exam="PrEbOaRd1819";
    CHANGE(Exam);
    cout<<Exam<<endl;
}
```

- (f) Observe the following C++ code and find out , which out of the given options i) to iv) are the expected correct output. Also assign the maximum and minimum value that can be assigned to the variable 'Key'. (2)

Note: Assume all required header files are already being included in the program.

```

void main()
{   int X [5] = {100,75,10,125,50}, P;
    int Key = random(2)+1;
    for (int i = Key; i < 5; i++)
        cout << X[i] << " ";
    }

```

- (i) 100\$75                      (ii) 75\$10\$125\$50\$  
 (iii) 75\$10\$125\$              (iv) 10\$125\$

- 2 (a) What is a temporary instance? Illustrate with a suitable C++ example. (2)
- (b) Write the output of the following C++ code. Also, write the name of feature of Object Oriented Programming used in the following program jointly illustrated by the Function 1 to Function 3. (2)

```

class seminar
{
char topic[30];
int charges;
public:
seminar()                      //Function 1
{
strcpy(topic,"Registration");
charges=5000;
}
seminar(char t[])              //Function 2
{
strcpy(topic,t);
charges=5000;
}
seminar(int c)                  //Function 3
{
strcpy(topic,"Registration with Discount");
charges=5000-c;
}
void show()
{
cout << topic << "@" << charges << endl;
}
};
void main()
{
seminar s1,s2(1000);
s1.show();
s2.show();
}

```

**OR**

(b) Write any four differences between Constructor and Destructor function with respect to object oriented programming.

(c) Define a class Bill in OOP with the following specification:-

(4)

**Private members:**

- Bill\_no - type long(bill number)
- Bill\_period - type integer(number of months)
- No\_of\_calls - type integer(number of mobile calls)
- Payment\_mode - type string(“online” or “offline”)
- Amount - type float(amount of bill)
- Calculate\_Bill() function to calculate the amount of bill given as per the following conditions:

No_of_calls	Calculation Rate/call(in rupees)
<=500	1.0
501-1200	2.0
>1200	4.0

Also, the value of Amount should be reduced by 5% if Payment\_mode is “online”.

**Public members:**

- A member function New\_Bill() that will accept the values for Bill\_no, Bill\_period, No\_of\_calls, Payment\_mode from the user and invoke Caluclate\_Bill() to assign the value of Amount.
- A member function Print\_Bill() that will display all details of a Bill.

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

(4)

```
class COMPANY
{ private :
    char Manufacturer [30];
    char addr[15];
public:
    COMPANY( );
    void RCOMP( );
    void DCOMP( );
};
class TOY: public COMPANY
{ private:
    char Tcode[10];
public:
    double cost_of_toy;
    TOY( );
    void RTOY ( );
    void DTOY( );
};
class BUYER: public TOY
{ private:
    char nm[30];
```

```

public:
    BUYER( );
    void RBUYER( );
    char delivery_date[10];
    char baddr;
    void DBUYER( );
    };
void main ( )
{   BUYER B;           //Statement 1
    _____        //Statement 2
}

```

- (i) Write the names of all the member functions, which are directly accessible by the object B of class BUYER as declared in main() function.
- (ii) Write the names of all the data members, which are directly accessible by the member function DBUYER( ) of class BUYER.
- (iii) Write Statement 2 to call function RTOY( ) of class TOY from the object B of class BUYER.
- (iv) What will be the order of execution of the constructors, when the object B of class BUYER is declared inside main()?

**OR**

Consider the following class CUSTOMER :

```

class CUSTOMER
{
intCustno;
    char CustName[20];
protected:
    void Register();
public:
    CUSTOMER();
    void Status();
};

```

Write a code in C++ to publically derive another class 'SHOP' with the following additional members derived in the public visibility mode.

**Data Members :**

VoucherNo    string  
SalesDate     string  
Discount      int

**Member functions :**

INPUT( ) : To enter VoucherNo, SalesDate and Discount  
OUTPUT( ) : To display the data members on the screen.

- 3 (a) Write a user-defined function `No_Multiple7(int A[][4],int R,int C)` in C++ to find (2) and display the sum of all the values, which are not multiples of 7.  
For example if the content of array is:

21	16	14
19	35	4

The output should be **39**

**OR**

Define a function `SWAPROW( )` in C++ to swap (interchange) the first row elements with the last row elements, for a two dimensional integer array passed as the argument of the function.

- (b) Write a user-defined function `EXTRA_ELE(int A[ ], int B[ ], int N)` in C++ to find (3) and display the extra element in Array A. Array A contains all the elements of array B but one more element extra. (Restriction: array elements are not in order)

Example: If the elements of Array A is 14, 21, 5, 19, 8, 4, 23, 11  
and the elements of Array B is 23, 8, 19, 4, 14, 11, 5  
Then output will be 21

**OR**

Write a function in C++ which accepts an integer array and its size as arguments and replaces elements having even values with its half and elements having odd values with twice its value.

eg: if the array contains : 3, 4, 5, 16, 9  
then the function should be rearranged as 6, 2, 10, 8, 18

- (c) An array `P[30][10]` is stored in the memory with each element requiring 2 bytes of (3) storage. If the address of `P[10][5]` is 4500, find out memory location of `P[12][8]` if the content is stored along the row.

**OR**

An array `P[20][30]` is stored in the memory along the column with each of the element occupying 4 bytes. Find out the address of element `P[4][10]`, if the element `P[2][20]` is stored at the memory location 5000.

- (d) Write the definition of a member function `Ins_Book()` for a class `CQUEUE` in C++, (4) to add a Book in a statically allocated circular queue of `BOOKs` considering the following code is already written as a part of the program:

```
struct Book
{
    long Bid;
    char Bname[20];
};
const int size=10;
```

```

class CQUEUE
{
    Book B[size];    int
    Front, Rear;
    public:
    CQUEUE()
    {
        Front = -1; Rear = -1;
    }
    void Ins_Book(); // To add book in a static circular queue
    void Del_Book(); // To remove book from a static circular queue
    void Show_Book(); // To display static circular queue
};

```

**OR**

Write a function in C++ to insert a node containing player's information, from a dynamically allocated Queue of Players implemented with the help of the following structure:

```

struct Player
{
    long PNo;
    char PName[20];
    Player *Next;
};

```

- (e) Convert the following Infix expression to its equivalent Postfix expression, showing the stack contents for each step of conversion. (2)

**A + ( B \* C - ( D / E ) ) \* F**

**OR**

Evaluate the following Postfix expression :

**40 , 5 , / , 5 , 3 , \* , 5 , - , +**

- 4 (a) Write a function RevText() to read a text file " Input.txt " and print only word starting with 'L' or 'S' in reverse order . (2)

**Example: If value in text file is: I LOVE MY SCHOOL**

**Output will be: I EVOL MY LOOHCS**

**OR**

- (a) Write a function in C++ to count the number of all characters other than digits present in a text file "STORY.txt".

Eg: If the file contains

Archana had 35 sheep. She sold 5 of them.

Then the output would be: 38

- (b) Assuming the class VEHICLE as declared below, write a function in C++ to read the objects of VEHICLE from binary file VEHICLE.DAT and display those vehicles, which are priced between 200000 and 250000. (3)

```
class VEHICLE
{
    int VNO;//Vehicle Number
    char VDesc[10] ;//Vehicle Description
    float Price;
    public :
    void GET() {cin>>VNO;gets (VDesc) ;cin>>Price;}
    void VIEW ( ) { cout<<VNO<<endl<<VDesc<<endl<<Price<<endl ; }
    float ReturnPrice ( ) {return Price;}
};
```

**OR**

Write a function in C++ to add more new objects at the bottom of a binary file "EMPLOYEE.dat", assuming the binary file is containing the objects of the following class :

```
class EMP
{
    int Eno;
    char Ename[20]; public:
    void Enter()
    {cin>>Eno;gets(Ename);}
    void show()
    {count << Eno<<Ename<<endl;}
};
```

- (c) Find the output of the following C++ code considering that the binary file MOBILE.DAT exists on the hard disk with a list of data of 250 mobiles. (1)

```
class MOBILE
{
    int MCode;
    char MName[20];
    public:
    void MEntry();
    void MDisp();
};

void main()
{
    fstream Fin; Fin.open("MOBILE.DAT",ios::binary|ios::in);
    MOBILE M;
    Fin.seekg(-50*sizeof(M),ios:end);
    cout<<" Count @: "<<Fin.tellg()/sizeof(M)<<endl;
    Fin.seekg(85*sizeof(M));
    Fin.read((char*)&M, sizeof(M));
    Fin.read((char*)&M, sizeof(M));
}
```



```

    Fin.read((char*)&M, sizeof(M));
    cout<<"Now @:"<<Fin.tellg()/sizeof(M) + 2; Fin.close();
}

```

**OR**

Which file stream is required for tellp() ?

- 5 (a) Observe the following table and answer the parts(i) and(ii) accordingly (2)

**Table:Product**

Pno	Name	Qty	PurchaseDate
101	Pen	102	12-12-2011
102	Pencil	201	21-02-2013
103	Eraser	190	09-08-2010
109	Sharpener	90	31-08-2012
113	Pen	900	12-12-2011

- (i) Write the names of most appropriate columns, which can be considered as candidate keys.
- (ii) If 2 more columns and 3 more rows are added to the above table, what will be the degree and cardinality of the table?
- (b) Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) to (viii), which are based on the tables. (6)

**TABLE : SUPPLIER**

SCODE	SNAME
11	Arya Stationers
12	Stationery House
13	Sapna Stores

**TABLE : SHOP**

ICODE	INAME	SCODE	QTY	RATE	BUYDATE
1005	Note Book	13	120	24	03-May-13
1003	Eraser	12	80	5	07-Aug-13
1002	Pencil	12	300	10	04-Mar-13
1006	Bag	11	70	300	27-Dec-12
1001	Pen	13	250	20	18-Jul-13
1004	Sharpener	12	100	10	23-Jun-13
1009	Box	11	50	80	17-Dec-12

- (i) To display details of all the items in the table shop in ascending order of Buydate
- (ii) To display ICODE and INAME of the items with QTY more than 100.
- (iii) To display the ICODE, INAME and TOTAL AMOUNT of each item ( TOTAL AMOUNT is the product of QTY and RATE).
- (iv) To display SCODE and Number of items supplied for each Supplier.
- (v) SELECT ICODE FROM SHOP WHERE INAME LIKE '%B%';
- (vi) SELECT SUM(QTY) FROM Shop where SCODE=11;
- (vii) SELECT INAME, SNAME FROM Shop S, Supplier P WHERE S.Score = P.Score AND ICODE = 1006 ;
- (viii) SELECT SCODE, COUNT(\*), MIN (BUYDATE) FROM Shop GROUP BY SCODE HAVING COUNT(\*)>2;

- 6 (a) State De Morgan's laws of Boolean Algebra and verify it using truth table. (2)
- (b) Draw the Logic Circuit of the following Boolean Expression: (2)  
 $Y = A.B + C.D'$
- (c) Derive a Canonical POS expression for a Boolean function F(P,Q,R) represented by the following truth table: (1)

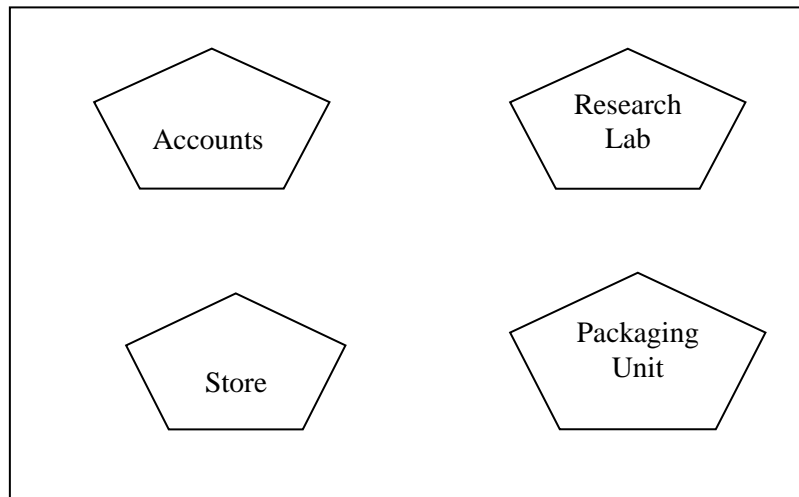
P	Q	R	F(P, Q, R)
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1

- (d) Reduce the following Boolean Expression to its simplest form using K-Map: (3)

$$F(A,B,C,D) = \Sigma(0,1,3,5,6,7,9,11,13,14,15)$$

- 7 (a) What are cookies? (1)
- (b) Which of the following crime(s) does not come under cybercrime? (1)
- (i) Copying some important data from a computer without taking permission from the owner of the data.
  - (ii) Stealing keyboard and mouse from a shop.
  - (iii) Getting into unknown person's social networking account and start messaging on his behalf.

- (c) Mr. Raghu wants to send money to his friend through his mobile. Suggest any two mobile app that he can use for transferring money to his friend's account. (1)
- (d) Smruti has typed the following in the address bar of Internet Explorer: [http://www.ncert.nic.in/programmes/talent\\_exam/index\\_talent.html](http://www.ncert.nic.in/programmes/talent_exam/index_talent.html). Identify domain name and URL. (1)
- (e) Write the expanded names for the following abbreviated terms used in Networking and Communications: (2)
- (i) NIC
  - (ii) WLL
  - (iii) IMAP
  - (iv) GPRS
- (f) ABS Media Center has set up its new center in Brunei. It has four buildings as shown in the diagram given below: (4)



**Distances between various buildings are as follows:**

Accounts to Research Lab	55 m
Accounts to Store	150 m
Store to Packaging Unit	160 m
Packaging Unit to Research Lab	60 m
Accounts to Packaging Unit	125 m
Store to Research Lab	180 m

### Number of Computers

Accounts	25
Research Lab	100
Store	15
Packaging Unit	60

As a network expert, provide the best possible answer for the following queries:

- i) Suggest a suitable cable layout of connections between the buildings.
- ii) Suggest the most suitable place (i.e. buildings) to house the organization. Justify your answer.
- iii) Suggest a system (hardware/software) to prevent unauthorized access to or from the network.
- iv) Suggest the placement of the following device with justification:  
(a) Repeater      (b) Hub/Switch