

**INTERNATIONAL INDIAN SCHOOL, DAMMAM**  
**Second Terminal Examination – November 2017**  
**Computer Science – Class XII**

Time: 3 Hrs  
Marks: 70

Set B

1. (a) Define the concept of macro in C++ with suitable example. (2)
- (b) Out of the following, find those identifiers which cannot be used for naming variables, constants or functions in a C++ program : (2)

Cost\*Qty, \_Price, int, Case, Number One, New, Number12, break

- (c) Write the names of the header files needed for successful compilation and execution of the following code : (1)

```
void main()  
{  
    char STR[80];  
    gets(STR);  
    puts(strrev(STR));  
}
```

- (d) Write the related library function name based upon the given information in C++: (1)
- i. Function to set the field width of the output. Available in `iomanip.h`
  - ii. Function to check whether given character is alpha numeric character or not. Available in `ctype.h`.

- (e) Rewrite the following C++ program after removing all the syntactical errors (if any), underlining each correction. : (2)

```
include<iostream.h>  
#define PI=3.14  
void main()  
{  
    float r;  
    cout<<"enter any radius";  
    cin<<r;  
    area=PI*pow(r,2);  
    cout<<"Area="<<area;  
}
```

- (f) Find and write the output of the following C++ program code : (2)  
Note: Assume all required header files are already included in the program.

```
typedef char STRING[80];  
void SCRAMBLE(STRING S)  
{  
    int Size=strlen(S);
```

```

for(int I=0;I<Size-1;I+=2)
{
    char WS=S[I];
    S[I]=S[I+1];
    S[I+1]=WS;
}
for(I=1;I<Size;I+=2)
    if(S[I]>='I' && S[I]<='S')
        S[I]='$';
}

void main()
{
    STRING Txt="ORIGINALITY";
    SCRAMBLE(Txt);
    cout<<Txt<<endl;
}

```

- (g) Find and write the output of the following C++ program code : (3)  
 Note: Assume all required header files are already included in the program.

```

struct scores
{
    int x,y;
};

void add(scores &a,scores b)
{
    a.x+=b.x;
    b.y+=a.y;
    cout<<a.x<<": "<<a.y<<": "<<b.x<<": "<<b.y<<endl;
}

void main()
{
    scores p={10,20}, q={15,25};
    add(p,q);
    add(q,p);
    cout<<p.x<<": "<<p.y<<": "<<q.x<<": "<<q.y<<endl;
}

```

- (h) Find and write the output of the following C++ program code : (3)  
 Note: Assume all required header files are already included in the program.

```

void main()
{
    char *Text="CLOVER";
    int *P, Num[]={1,3,5,7};
    P=Num;
    cout<<*P<<Text<<endl;
}

```

```

Text++; P++;
cout<<*P<<Text<<endl;
Text++;P++;
cout<<*P<<"&"<<*Text;
}

```

- (i) Look at the following C++ code and find the possible output(s) from the options (i) to (iv) following it. Also, write the maximum values that can be assigned to each of the variables M and N. Assume all the required header files are already being included in the code. (2)

```

void main()
{
    randomize();
    int M=random(4),N=random(3),R,C;
    int MATRIX[3][3] = {{1,2,3},{2,3,4},{3,4,5}};
    for(R=0; R<M; R++)
    {
        for(C=0; C<N; C++)
            cout<<MATRIX[R][C]<<" ";
        cout<<endl;
    }
}

```

- |          |           |          |         |
|----------|-----------|----------|---------|
| i) 1 2 3 | ii) 1 2 3 | iii) 1 2 | iv) 1 2 |
| 2 3 4    | 2 3 4     | 2 3      | 2 3     |
| 3 4 5    |           |          | 3 4     |

2. (a) Define data hiding in the context of Object Oriented Programming. Illustrate with an example. (2)

- (b) Define a class Customer with the following specifications. (4)

Private Members :

- CustomerNo integer
- CustomerName String(20 chars)
- Qty integer
- Price float
- TotalPrice float
- Discount float
- NetPrice float
- Function CalcDiscount() - To calculate and assign TotalPice, Discount (according to TotalPrice) and NetPrice as given below:

➤ TotalPrice = Price\*Qty

TotalPrice	Discount
>=50000	25% of TotalPrice
25000 - 49999	15% of TotalPrice
<250000	10% of TotalPrice

➤ Netprice= TotalPrice-Discount

Public members:

Input() - to read data members(CustomerNo, CustomerName, Qty and Price) and call the function CalcDiscount().

Show() - to display Customer details.

3. (a) Write a user defined function named Flip() that will accept an integer array and its size as arguments and move every element to its previous position, and the first element to the last position. (3)

Eg. if initially an array of seven elements is:

5, 16, 4, 7, 19, 8, 2

After execution of the above function, the contents of the array will be:

16, 4, 7, 19, 8, 2, 5

- (b) Write the definition of a user-defined function REPEAT\_ROW(int A[][],int R, int C) in C++ that will store the elements in the following manner: (2)

- In row1 all elements except the 1st element replaced by the 1st element
- In row2 all row elements except the 1st & 2nd element replaced by the 2nd element
- In row3 All row elements except the 1st , 2nd & 3rd element replaced by the 3rd element

and so on.

For example: if initially the array was:-

5	6	10	2
2	6	9	12
18	14	5	6

Then, the contents of the array after execution of the above function will be:-

5	5	5	5
2	6	6	6
18	14	5	5

- (c) Array A[15][20] is a two-dimensional array, which is stored in the memory along the row with each of its elements occupying 4 bytes. Find the address of the element A[15][5], if the element A[10][10] is stored at the memory location 3000. (3)

- (d) Consider the following structure. (3)

```
struct address
{
    int id;
    char home_add[50];
    int phone;
}
```

Write a function in C++ which accepts an array of addresses and its size as arguments and sorts it in ascending order of id using Selection Sort.

- (e) Write the definition of a member function Q\_Insert() for a class Queue in C++ to insert a new Candidate information in a dynamically allocated queue whose code is already given below as a part of the program (assume all necessary header files are included in program): (4)

```
struct Candidate
{
    int Cand_Id;
    char Cand_Name[21];
    Candidate *Link;
};

Class Queue
{
    Candidate *Front, *Rear;
public:
    Queue()
    {
        Front=Rear=NULL;
    }
    void Q_Insert();
    void Q_Delete();
};
```

- (f) Convert the following infix expression to postfix. Show the stack status for every step: (2)  
 $(A+4) * 10 - (40 / B) / 2$
- (g) Evaluate the following Postfix expression. Show the status of stack after execution of each operation: (2)  
60, 60, +, 12, 20, 10, /, -, \*
4. (a) Write a user-defined function named Count() that will read the contents of text file named "Speech.txt" and display the count of the number of sentences that start with the word "But". Assume that all sentences end with a full stop (.). (2)

(b) Write a function in C++ to a text file "IdList1.txt" and copy the contents to "IdList2.txt" after replacing all the uppercase letters with lowercase letters. (2)

(c) Consider a binary file "PROD.DAT", containing objects of the following class: (3)

```
class product
{
    int p_id;
    char p_name[20];
    float price;
public:
    void inputdata();//function to input values
    void displaydata(); //function to display values
    int getid(){return p_id;}
    char *getname(){return p_name;}
    float getprice(){return price;}
};
```

Write a function in C++ to read and display the details of all products with id numbers ending with 7.

(d) Find the output of the following C++ code considering that the binary file pets.dat already exists on the hard disk with 10 records in it. (1)

```
class pet
{
    int p_id;
    char p_name[10];
    int age;
    float price;
public:
    void entry();
    void show();
    void locate();
};

pet p;

void pet::locate()
{
    ifstream ifile;
    ifile.open("pets.dat");
    ifile.seekg(0);
    while(ifile.read((char*)&p, sizeof(p)))
    {
        cout<<"\n"<<ifile.tellg()/sizeof(p);
    }
    ifile.close();
}
```

```

void main()
{
    p.locate();
}

```

- (e) Go through the program segment and answer the question that follows: (1)

```

class student
{
    int rollno;
    char stuname[20];
    float marks;
public:
    void input();//function to input values
    void show();// function to display records
    float getno(){return rollno;}
}

void replace(int no)
{
    fstream file;
    file.open("stu.dat",ios::in|ios::out|ios::binary);
    student s;
    int count=0, found=0;
    while(!found && file.read(char*)&s,sizeof(s))
    {
        if(no==s.getno())
        {
            found=1;
            cout<<"Enter new data";
            s.input();
            _____ //statement 1
            _____ //statement 2
        }
        count++;
    }
    if(found==1) cout<<"record updated";
    file.close();
}

```

Write statement1 to position the file pointer at the position of the record to be changed. Write statement 2 to write the new record at that position.

5. (a) Based on the following tables, write the SQL commands for the statements (i) to (vi) (1 mark each) and outputs for SQL queries (vii) to(x) (1/2 mark each) (8)

Table: MobileMaster

M_Id	M_Company	M_Name	M_Price	M_Mf_Date
MB001	Samsung	Galaxy	4500	2013-02-12
MB003	Nokia	N1100	2250	2011-04-15
MB004	Micromax	Unite3	4500	2016-10-17
MB005	Sony	XperiaM	7500	2017-11-20
MB006	Oppo	SelfieEx	8500	2010-08-21

Table: MobileStock

S_Id	M_Id	M_Qty	M_Supplier
S001	MB004	450	New Vision
S002	MB003	250	Praveen Gallery
S003	MB001	300	Classic Mobile Store
S004	MB006	150	A-one Mobiles
S005	MB003	150	The Mobile
S006	MB006	50	Mobile Centre

- i. Display the Mobile names, prices and manufacturing dates of mobiles in descending order of their prices.
- ii. List the details of mobiles whose names have 'n' as the second last letter.
- iii. Display the mobile IDs and supplier names of all mobiles whose quantity is in the range 250-450 (both limits included).
- iv. Display the mobile names along with their supplier names.
- v. Display the mobile names, company names and quantities in stock for all mobiles with manufacturing date before 2010-01-01.
- vi. Display the total of quantities for each M\_Id from the table Mobilestock
- vii. `SELECT M_Id, AVG(M_Qty) FROM MobileStock GROUP BY M_Id;`
- viii. `SELECT COUNT(M_Id) FROM MobileMaster WHERE M_Price>4500;`
- ix. `SELECT MAX(M_Mf_Date), MIN(M_Mf_Date) FROM MobileMaster;`
- x. `SELECT M_Name, M_Price, M_Qty, M_Supplier FROM MobileMaster M, MobileStock S WHERE M.M_Id=S.M_Id AND S.M_Qty<=150;`



6. (a) State and prove (algebraically) the Absorption Laws in Boolean algebra. (2)
- (b) What do you mean by the principle of Duality? Why is it so important in Boolean Algebra? (2)
- (c) Draw the equivalent logic circuit diagram of the following Boolean expression using NOR gates: (2)  
 $(A' + B).C$
- (d) Derive a Canonical Sum Of Product expression for a Boolean function G, represented by the following truth table : (1)

X	Y	Z	G(X, Y, Z)
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

- (e) Reduce the following Boolean Expression using K Map: (3)

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