

Model Sample Paper – 2015

Class – XII

Computer Science (083)

Time: 3 Hours

MM: 70

Instructions:

(i) **All questions are compulsory.**

(ii) **Programming Language C++.**

1. (a) What is the difference between Actual Parameter and Formal Parameter?
Also, give a suitable C++ code to illustrate both. 2

(b) Write the name of the header files which is/are essentially required to
run/execute the following C++ code: 1

```
void main( )
{
    char ch, word[ ] = "Magic Box";
    For(int i= 0; word[i] != '\0' ; i++)
    If (word[i] ==' ')
        cout<<endl ;
    else
    {
        ch = tolower(word[i]);
        cout<<ch;
    }
}
```

(c) Rewrite the following program code after removing all syntax error (if
any). Underline each correction: 2

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

```

};
void main( )
{
    User U;
    Authorize. U( );
    Show( );
}

```

- (d) Find the output of the following program:

2

```

#include<iostream.h>
struct THREE_D
{
    int X,Y,Z; };
void MoveIn(THREE_D &T,int Step=1)
{
    T.X+=Step;
    T.Y-=Step;
    T.Z+=Step;
}
void MoveOut(THREE_D &T,it Step=1)
{
    T.X-=Step;
    T.Y+=Step;
    T.Z-=Step;
}
void main( )
{
    THREE_D T1={10,20,5}, T2={30,10,40};
    MoveIn(T1);
    MoveOut(T2,5);
    cout<<T1.X<<","<<T1.Y<<","
    <<T1.Z<<endl;
    cout<<T2.X<<","<<T2.Y<<","
    <<T2.Z<<endl;
    MoveIn(T2,10);
    cout<<T2.X<<","<<T2.Y<<","
    <<T2.Z<<endl;
}

```

- (e) Find the output of the following program:

3

```

#include<iostream.h>
void FunCode (char msg [ ], char CH)
{
    for (int C = 0 ; msg[C] !='\0' ; C ++ )
    {
        if (msg[C] >= 'B' && msg[C] <= 'G')
            msg[C] = tolower (msg [C ] );
        else
            if (msg[C] == 'A' || msg[C] == 'a')

```

```

        msg[C] = CH;
    else
    if (C % 2 == 0)
        msg[C] = toupper (msg[C]);
    else
        msg[C] = msg[C - 1];
}
void main( )
{
    char Code [ ] = "BluERayDiSK";
    FunCode ( Code, '@');
    cout<< "New Text:" <<Code <<endl;
}

```

- (f) Go through the C++ code shown below, and find out the possible output or outputs from the suggested output options (i) to (iv). Also write the minimum and maximum value, which can be assigned to the variable YourNum. 2

```

#include<iostream.h>
#include<stdlib.h>
void main( )
{
    randomize( );
    int YourNum, Max = 5;
    YourNum = 20 + random (Max );
    for (int N = YourNum ; N < 25 ; N++ )
        cout<< N << "*";
}

```

- (i) 20 * 21 * 22 * 23 * 24 * 25
(ii) 22 * 23 * 24 * 25 *
(iii) 23 * 24
(iv) 21 * 22 * 23 * 24 * 25

2. (a) What do you understand by Data Encapsulation and Data Hiding? Also, give an example in C++ to illustrate both. 2

- (b) Give the output of the following C++ code. Also write the name of the feature of Object Oriented Programming used in the following program jointly illustrated by the function [i] to [iv]. 2

```

#include<iostream.h>
void Row( ) // Function [ i ]
{
    for( int J = 1 ; J<=80 ; J++)    cout <<"-";
    cout<<endl;
}

```

```

void Row( int N) // Function [ ii ]
{
    for( int J = 1 ; J<=N ; J++) cout <<"*";
    cout<<endl;
}
void Row (char Ch, int N) // Function [ iii ]
{
    for( int J = 1 ; J<=N ; J++) cout <<Ch;
    cout<<endl;
}
void Row( int M, int N) // Function [ iv ]
{
    for( int J = 1 ; J<=N ; J++) cout <<M*J;
    cout<<endl;
}
void main( )
{
    int X = 9, Y = 4, Z = 3;
    char C = '#';
    Row(C, Y);
    Row(X, Z);
}

```

- (c) Define a class CARRENTAL in C++ with following description: 4
Private Members:

- CarId of type integer
- AboutCar of type string
- CarType of type string
- Rent of type float
- A Function Assign_Rent() to calculate Rent of Car as per the following rules:

CarType	Rent
Small	1000
Van	800
SUV	2500

Public Members:

- A function GetCar() to allow user to enter values for CarId, AboutCar, CarType, and call function Assign_Rent () to calculate the Car Rent.
- A function ShowCar() to allow user to view the content of all the data members.

- (d) Answer the question (i) to (iv) based on the following: 4
class Organization

```

{
    char Address[20];
    double Budget, Income;
protected:
    void Compute( );
public:
    Organization( );
    void Get( );
    void Show( );
};
class WorkArea : public Organization
{
    char Address[20];
    int Staff;
protected:
    double Pay;
    void Calculate( );
public:
    WorkArea( );
    void Enter( );
    void Display( );
};
class ShowRoom : private Organization
{
    char Address[20];
    flat Area;
    double Sale;
public:
    ShowRoom( );
    void Input( );
    void Show( );
};

```

- (i) Name the type of inheritance illustrated in the above C++ code.
 - (ii) Write the name of data members, which are accessible from member function of class ShowRoom.
 - (iii) Write the name of all the member function, which are accessible from objects belonging to class WorkArea.
 - (iv) How many bytes will be required by an object of class ShowRoom?
3. (a) Write a function Swap2Change(int p[], int N) in C++ to modify the content of the array in such a way that elements, which are multiples of 10 swap with the values present in the very next position in the array.3
For Example:

If the content of the array P is:

91, 50, 54, 22, 30, 54

Then the content of the array should become:

91, 54, 50, 22, 54, 30

- (b) An array S[10][30] stored in the memory along the column with each of the elements occupying 2 bytes. Find out the memory location of S[5][10], if the element S[2][15] is stored at the location 8200. 3

- (c) Write a function in C++ to perform Insert operation in a dynamically allocated Queue containing name of students. 4

```
struct Student
{
    int RNo;
    char Name[20];
    Student *Next;
};
```

- (d) Write a function in C++ to find the sum of both left and right diagonal elements from a two dimensional array MAT[3][3]. 2

For Example:

If the array MAT contents the elements:

5	9	4
6	7	8
2	5	3

Then the output should be:

Sum of left diagonal : 15

Sum of right diagonal : 13

- (e) Evaluate the following POSTFIX notation. Show status of stack after every step of evaluation. 2

False, NOT, true, AND, true, false, OR, AND

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

```
#include <fstream.h>
```

```
class Item
```

```
{
```

```
int Ino;char Item[20];
```

```
public:
```

```
//Function to search and display the content from a particular //record number
```

```
void Search(int );
```

```
//Function to modify the content of a particular record number
```

```

void Modify(int);
};
void Item::Search(int RecNo)
{
fstream File;
File.open("STOCK.DAT",ios::binary|ios::in);

-----
//Statement 1
File.read((char*)this,sizeof(Item));
cout<<Ino<<"=="<<Item<<endl;
File.close();
}
void Item::Modify(int RecNo)
{
fstream File;
File.open("STOCK.DAT",ios::binary|ios::in|ios::out);
cout>>Ino;cin.getline(Item,20);

-----
//Statement 2
File.write((char*)this,sizeof(Item));
File.close();
}

```

- (b) Write a function in C++ to read the content of a text file "Place.TXT" and display all those lines on screen which are either starting with "P" or starting with "S". 2
- (c) Write a function in C++ to search for the details (Numbers & Calls) of those Mobiles, which have more than 100 calls from a binary file "Mobile.DAT". Assuming that the binary file contains the records of the following class Mobile: 3

```

class Mobile
{
    char Number[20];
    int Calls;
public:
    void Enter( ) { gets(Number) ; cin>>Calls ; }
    void Billing( ) { cout<< Number << "# " << Calls << endl; }
    int GetCall( ) { return Calls ; }
};

```

5. (a) Give a suitable example of a table with simple data illustrate Primary and Candidate Keys in it. 2
- (b) Consider the following table FLIGHT and FARES. Write the SQL commands for the statements (i) to (iv) and output from (v) to (viii). 6

Table: FLIGHT

FL_NO	DEPARTURE	ARRIVAL	NO_FLIGHTS	NOOFSTOPS
IC301	MUMBAI	DELHI	8	0
IC799	BANGALORE	DELHI	2	1
MC101	INDORE	MUMBAI	3	0
IC302	DELHI	MUMBAI	8	0
AM812	KANPUR	BANGALORE	3	1
IC899	MUMBAI	KOCHI	1	4
AM501	DELHI	TRIVANDRUM	1	5
MU499	MUMBAI	MADRAS	3	3
IC701	DELHI	AHMEDABAD	4	0

Table: FARE

FL_NO	AIRLINES	FARE	TAX%
1C701	Indian Airlines	6500	10
MU499	Sahara	9400	5
AM501	Jet Airways	13450	8
IC899	Indian Airlines	8300	4
1C302	Indian Airlines	4300	9
1C799	Indian Airlines	10500	10
MC101	Deccan Airlines	3500	4

- (i) Display Flight No, No of Flights arriving to the DELHI
- (ii) Display all the airlines that have maximum no of flights.
- (iii) Display total fare of all the airlines.
- (iv) To display departure and arrival points of flight no 1C302 and MU499.

Give the Output:

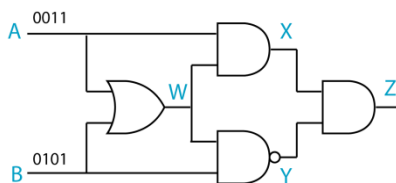
- (v) SELECT COUNT(DISTINCT FL_NO) FROM FLIGHT;
- (vi) SELECT MIN(NOOFSTOPS) FROM FLIGHT
WHERE FL_NO = 'IC899';
- (vii) SELECT AVG(FARE) FROM FARE
WHRE AIRLINES = 'Indian Airlines';
- (viii) SELECT FL_NO, NO_FLIGHTS FORM FLIGHT
WHERE DEPARTURE='MUMBAI';

6. (a) Verify the following using truth table:

2

- (i) $X + 0 = X$
- (ii) $X + X' = 1$

(b) Write the equivalent Boolean expression for the following Logic Circuit: 2



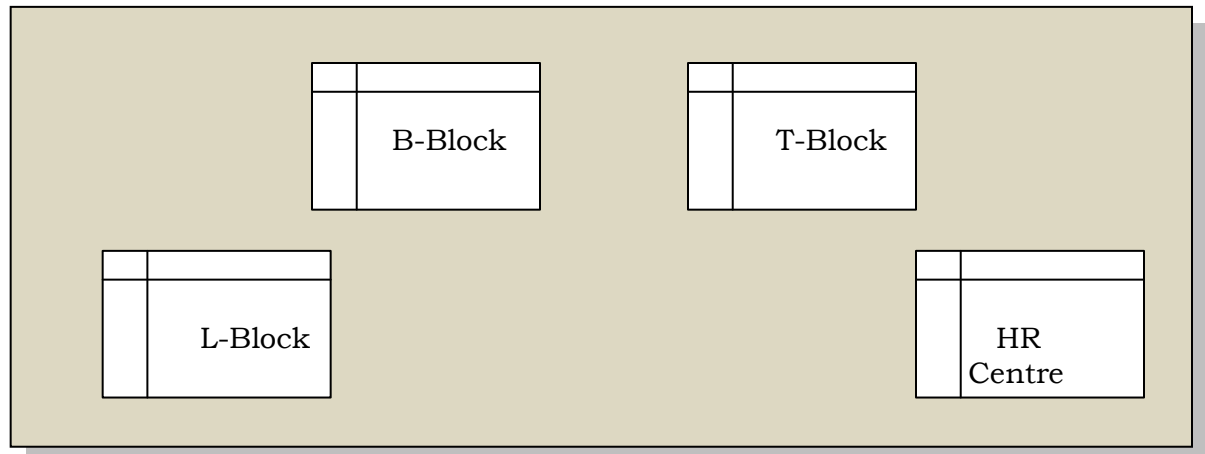
- (c) Given the truth table of a function $f(A, B, C)$, write the SOP form. 1

A	B	C	f
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

- (d) Reduce the following boolean expression using K-map: 3

$$f(P, Q, R, S) = \Sigma (0, 1, 2, 4, 5, 6, 8, 12)$$

7. (a) Differentiate between Internet and Intranet? 1
 (b) Give the full form of the following: 1
 (i) HSPDA (ii) EDGE
 (c) What is Protocol? Name the protocol that is responsible for carrying addresses of the packets. 1
 (d) Name two Server side scripting languages. 1
 (e) Global Village University is setting up its Academics blocks at Mathura and planning to setup a network. The University has 3 Academic block and one HR Centre as shown in the diagram below: 4



Block to Block distances are shown below:

L-Block to B-Block	40 m
L-Block to T-Block	80 m
L-Block to HR Centre	105 m
B-Block to T-Block	30 m
B-Block to HR Centre	35 m
T-Block to HR Centre	15 m

Number of Computers in each Block:

L-Block	15
T-Block	40
HR Centre	115
B-Block	25

- (e1) Suggest the most suitable place to install the Server of this university with suitable reason.
- (e2) Suggest an ideal layout for connecting these blocks for a wired connectivity.
- (e3) Which device would you suggest to be placed / installed in each block to efficiently connect all Computers within these blocks?
- (e4) The University is planning to connect its Admission office in the closest big city. Which is more than 200 Km from University. Which type of network out of LAN, MAN, or WAN will be formed?
- (f) Differentiate between Freeware and Shareware Software? 1
- (g) What is Cookies? 1

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