**Sample Paper – 2013**

**Class – XII**

**Sub : Computer Science**

**Time: 3 Hours MM: 70**

***Instructions:***

1. ***All questions are compulsory.***
2. ***Programming Language C++.***
3. (a) What is the difference between call by value and call by reference? Give a suitable example to illustrate

the same in C++. 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[ ] = “+ve Thinking”;

 For(int i= 0; word[i] ! = ‘\0’ ; i++)

 If (word[i] ==’ ‘)

 cout<<endl ;

 else

 {

 ch = toupper(word[i]);

 cout<<ch;

 }

 }

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

 #include<iostream.h> 2

 class TRAIN

{

 long TrainNo;

 char Destination[25];

public

 void AddInfo( )

 {

 cin>>TrainNo; gets(Destination);

 }

 void ShowInfo( )

 {

 cout<<TrainNo << “ : ” >>Destination << endl;

 }

};

void main( )

{

 Train T;

 Addinfo . T( );

 ShowInfo . T( );

}

 (d) Find the output of the following program: 3

 #include<iostream.h>

 void Change (int C[ ], int N, int devide)

 {

 for (int i = 0 ; i < N ; i++)

 if (i < devide )

 C[i] + = i;

 else

 C[i] \* = i;

 }

 void ShowData (char C[ ], int N )

 {

 for( int i = 0 ; i < N ; i++)

 (i % 2 == 0) ? cout<< C[i] <<”%” : cout << C[i] << endl;

 }

 void main( )

 {

 int K[ ] = {30, 40, 50, 20, 10, 5};

 Change(K, 6, 3);

 ShowData ( K, 6);

 }

 (e) Find the output of the following program: 2

 #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 << “\*”;

 }

1. 20 \* 21 \* 22 \* 23 \* 24 \* 25
2. 22 \* 23 \* 24 \* 25 \*
3. 23 \* 24
4. 21 \* 22 \* 23 \* 24 \* 25
5. (a) What do you understand by Data Encapsulation and Data Hiding? Also, give an example in C++ to

illustrate both. 2

(b) Write the output of the following C++ code. Also write the name of features of Object Oriented Programming used in the following program illustrated by the function [I] to [IV]. 2

 #include<iostream.h>

 void publish ( ) // Function [1]

 { for (int j =1 ; j <= 60 ; j ++ ) cout << “‒”;

 cout<< endl;

 }

 void publish ( int N) // Function [2]

 { for (int j =1 ; j <= N ; j ++ ) cout << “$”;

 cout<< endl;

 }

void publish ( int X, int Y) // Function [3]

 { for (int j =1 ; j <= Y ; j ++ ) cout << X\*j;

 cout<< endl;

 } // Function [4]

void publish (char C, int N )

 { for (int j =1 ; j <= N ; j ++ ) cout << C;

 cout<< endl;

 }

 void main( )

 { int U = 8, V = 5, W = 4 ;

 char T = ‘&’;

 publish(T, V);

 publish(U, W);

 }

(c) Define a class SUPPLY in C++ with following description: 4

 Private Members:

* PCode of type integer (Product Code)
* PName of type string (Product Name)
* Price of type float (Price of each Product)
* Qty of type integer ( Quantity is to be supply)
* Discount of type float (Discount percentage of product)
* A Function Calc\_Disc( ) to calculate discount as per the following rules:

If Qty <= 50 Discount is 0

If Qty >=50 and Discount is 5

 Qty <=100

If Qty > 100 Discount is 10

 Public Members:

* A function Purchase( ) to allow user to enter values for PCode, PName, Price, Qty and call function Calc\_Disc ( ) to calculate the Discount.
* A function ShowAll( ) to allow user to view the content of all the data members.

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

 class Student

 {

 int Rno;

 char Name[20];

 float Marks;

 protected:

 void Result( );

 public:

 Student( );

 void Register( );

 void Display( );

 };

 class Faculty

 {

 long FCode;

 char FName[20];

 protected:

 float Pay;

 public:

 Faculty;

 void Enter( );

 void Show( );

 };

 class Course : public Student, private Faculty

 {

 long CCode ; char CName[50];

 char StartDate[8], EndDate[8];

 public:

 Course( );

 void Science( );

 void CDetail( );

 };

1. Which type inheritance is shown in above example?
2. Write the names of all the data members, which is/are accessible from member function Science of class Course.
3. Write the name of member functions, which are accessible from objects of class course.
4. Write the names of all members, which are accessible from objects of class Faculty.

1. (a) Write a function CHANGE( ) in C++, which accepts an array of integers and its size as parameters and

divide all those elements by 5 which are divisible by 5 and multiply other array elements by 3. 3

Example:

If the array contains: 20 12 15 60 22

Then after CHANGE : 4 36 3 12 66

(b) An array P[20][50] is stored in the memory along the with row where each of its element occupying 4 bytes of storage. Find out the location of P[15][10], if P[0][0] is stored at 5200. 3

(c) Write a function in C++ to perform insert operation on a dynamically allocated Queue containing Books details as given in the following definition of node: 4

 struct NODE

 {

 long Book\_No;

 char Book\_Name[30];

 NODE \*Link;

 };

(d) Write a function int SKIPSUM(int A[ ][3], int N, int M) in C++ to find and return the sum of elements from all alternates elements of a two dimensional array starting from A[0][0]. 2

 Example: If the following is the content of the array:

|  |  |  |
| --- | --- | --- |
| A[0][0] | A[0][1] | A[0][2] |
| 4 | 5 | 1 |
| A[1][0] | A[1][1] | A[1][2] |
| 2 | 8 | 7 |
| A[2][0] | A[2][1] | A[2][2] |
| 9 | 6 | 3 |

 The function SKIPSUM( ) should add the elements A[0][0], A[0][2], A[1][1], A[2][0] AND A[2][2].

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

 True, False, NOT, AND, True, True, AND, OR

1. (a) Observe the program segment given below carefully and fill the blanks marked as Statement 1 and

Statement 2 using seekg( ), seekp( ), tellg( ), tellp( ) functions for performing the required task. 1

#include<fstream.h>

class Mobile

{

 int Sno, char CName, float Price;

public:

.

.

 void updatePrice( );

};

void Mobile :: updatePrice( )

{

 fstream file;

 file.open(“M.dat”, ios::binary | ios::in | ios::out);

 int Sl;

 cout<<” Enter serial number to modify price:” ; cin>>Cl;

 while(file.read((char \*) this, sizeof(Mobile)) )

 {

 if(Cl = = Sno)

 {

 cout<< “Present price :” << Price << endl;

 cout<<”Changed price:” ; cin >> Price;

 int filePos = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; // Statement 1

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; // Statement 2

 file.write( (char\*) this, sizeof (mobile) );

 }

 }

 file.close( );

}

(b) Write a function in C++ to count the no of “these” or “those” words present in a text fiel “WORD.TXT”. [Note that the words “these” and “those” are complete words]. 2

(c) Write a function a C++ to search for a camera from a binary file “CAMERA.DAT” containing the objects of the class Camera. The user should enter the model no and the function should search and display the details of the camera. 3

 class Camera

 {

 long ModelNo;

 float MegaPixel;

 int Zoom;

 char Details[100];

 public:

 void Input( ) { cin>>ModelNo >> MegaPixel >> Zoom ; gets(Details) ; }

 void Output( ) { cout << ModelNo << MegaPixel << Zoom << Details ; }

 long getModelNo( ) { return ModelNo; }

 };

1. (a) What do you understand by Candidate Key in a table? Give a suitable example Candidate Keys from a

table containing some meaning data. 2

Consider the following two tables WORKER and PLAYLEVEL and answer the (b) and (c) part of this question:

**Table: WORKER**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***ECODE*** | ***NAME*** | ***DESIG*** | ***PLEVEL*** | ***DOJ*** | ***DOB*** |
| 11 | Radhey Shyam | Supervisor | P001 | 13-Sep-2004 | 23-Aug-1981 |
| 12 | Chander Nath | Operator | P003 | 22-Feb-2010 | 12-Jul-1987 |
| 13 | Fizza | Operator | P003 | 14-Jun-2009 | 14-Oct-1983 |
| 15 | Ameen Ahmed | Mechanic | P002 | 21-Aug-2006 | 13-Mar-1984 |
| 18 | Sanya | Clerk | P002 | 19-Dec-2005 | 09-Jun-1983 |

**Table: PLAYLAVEL**

|  |  |  |
| --- | --- | --- |
| ***PLEVEL*** | ***PAY*** | ***ALLOWANCE*** |
| P001 | 26000 | 12000 |
| P002 | 22000 | 10000 |
| P003 | 12000 | 6000 |

 (b) Write SQL commands for the following statements: 4

1. To display the details of all WORKERs in descending order of DOB.
2. To display NAME and DESIG of those WORKERs, whose PLEVEL is either P001 or P002.
3. To display the content of all the WORKERs table, whose DOB is in between ’19-Jan-1984’ and ’18-Jan-1987’.
4. To add a new row with the following:

19, ‘Daya kishore’, ‘Operator’, ‘P003’, ’19-Jun-2008’, ’11-Jul-1984’

 (c) Give the output of the following SQL queries: 2

1. SELECT COUNT (PLEVEL), PLEVEL FROM WORKER GROUP BY PLEVEL;
2. SELECT MAX(DOB), MIN(DOJ) FROM WORKER;
3. SELECT NAME, PAY FROM WORKER W, PLAYLEVEL P

WHERE W.PLEVEL = P.PLEVEL AND W.ECODE < 13;

1. SELECT PLEVEL, PAY + ALLOWANCE FROM PAYLEVEL WHERE PLEVEL = ‘P003’;
2. (a) State and verify Absorption Law using Truth table. 2

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

(c) Write the POS form of a Boolean function F, which is represented in a truth table: 1

|  |  |  |  |
| --- | --- | --- | --- |
| ***U*** | ***V*** | ***W*** | ***F*** |
| 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 |

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

 $F\left(P,Q,R,S\right)=Σ (0, 1, 2, 4, 5, 6, 8, 12)$

1. (a) Differentiate between Bridge and Router? 1

(b) Give the full form of the following: 1

 (i) HSPDA (ii) WCDMA

(c) What is 3G? 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

 B-Block T-Block

 L-Block HR Centre

 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 firewall? 1

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