**Sample Paper – 2013
Class – XII
Subject – Computer Science**

**MAX. MARKS : 70 TIME : 3 HOURS**

*Note (i) All questions are compulsory. (ii) Programming Language : C++*

Q1.

1. Write a macro using #define directive to calculate semi-perimeter of a triangle. Use this macro in void main to calculate semi-perimeter of the triangle. **2**
2. Name the header file(s) that shall be needed for successful compilation of the following

 C++ code. **1**

*void main()*

*{ char name[20];*

*cout<<"Enter name :";*

*gets(name);*

*for(int i=0;name[i]!=’\0’;i++)*

*name[i]=toupper(name[i]);*

*cout<<"Name in upper case is ";*

*puts(name);*

*getch();*

*}*

1. Rewrite the following after making corrections in the following code, if any. Also underline the corrections made. **2**

*#include <iostream.h>*

*class phone*

*{ int no;*

*char areacode[10];*

*int calls;*

*phone (int i=0, char b);*

***public:***

*phone (phone A)*

*{ no = A.no;*

*areacode = A.areacode;*

*}*

*~phone( )*

*{cout << “Destroying Object” <<--calls<< “\n”;*

*} };*

*void main( )*

*{*

 *phone X, Y;*

*Y.no =10;*

*}*

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

 *#include<iostream.h>*

 *class train*

 *{ int mno,tripno,passengercount;*

 *public:*

 *train(int tmno=10)*

 *{ mno=tmno;*

 *tripno=0;*

 *passengercount=0; }*

 *void trip(int pc=30)*

 *{ tripno++;*

 *passengercount+=pc; }*

 *void statusshow()*

 *{ cout<<mno<<“:”<<tripno<<“:”*

*<<passengercount<<endl;*

 *} };*

 *void main()*

 *{ train m(15),t;*

 *m.trip();*

 *t.trip(25);*

 *m.statusshow();*

 *m.trip(50);*

 *t.statusshow();*

 *m.statusshow();*

*}*

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

*# include<iostream.h>*

*# include<ctype.h>*

*#include<string.h>*

 *void change (char \*state, int &s)*

 *{ int b=s;*

 *for (int x=0;s>=0;x++,s--)*

 *if ((x+s)%2)*

 *\*(state+x) = toupper(\*(state+b-x));*

 *}*

 *void main ( )*

 *{ char s[]="Punjab";*

 *int b = strlen(s)-1;*

 *change(s,b);*

 *cout<<s<<"#"<<b;*

 *}*

(f)Study the following program and select the ***possible output(s)*** from it : **2**

*#include<stdlib.h>*

*#include<iostream.h>*

*#include<string.h>*

*void main()*

*{*

*randomize();*

*char A[]="WELCOME";*

*int ToGo;*

*for(int I=0;I<strlen(A);I++)*

*{*

*ToGo=random (sizeof (ToGo)\*2) +1;*

*cout<<A[ToGo]<<":";*

*}*

*}*

a) W: E: L: C: O: M: E:

b) E: C: E: E: C: C: E:

c) E: C: E: E: C: C: O:

d) C: C: C: E: E: C: C:

Q2.

1. What do you understand by Polymorphism? Also, givean example in C++ to illustrate the

 same. **2**

1. Answer the questions (i) and (ii) after going through the following class : **2**

 class Factory

 { private:

 char Name[30];

 int worker;

 public:

 Factory( ) //function 1

 { strcpy(Name,”Blank”);

 worker=0; }

 void Details( ) //function 2

 { cout<<Name<<endl<<worker<<endl; }

 Factory(char \*Fact\_name, int No); //function 3

 Factory(Factory &F); // function 4 };

1. In OOP, what is ***function 3*** referred as? Write the function definition for ***function 3.***
2. Write statements which will invoke ***function 1, function 3 and function 4.***
3. Define a class Participant in c++ with the following description. **4**

**Private members:**

 Pname - **String** to store the participant name

 Age - **Integer** to store the participant age

 Category - **String** to store the category

 NOE - **Integer** to store number of events according to age

 Position - **Integer array** to store position hold by participant in each event

 TPoints - **Integer** to store the total points scored by the participant

* Calpoints() - function to read from the user the Position hold by participant in each events and calculate TPoints as sum of points based on the position hold by them as given below.

|  |  |
| --- | --- |
| **Position** | **Points** |
| 1 | 5 |
| 2 | 3 |
| 3 | 1 |
| 4 onwards | 0 |

**Protected members:**

* Assign()- function to assign Category and NOE based on age as follows and

|  |  |  |
| --- | --- | --- |
| **Age** | **Category** | **NOE** |
| <9 | SubJunior | 4 |
| >=9 and <=12 | Junior | 5 |
| >12 and <=14 | Inter | 6 |
| >14 and <=16 | Senior | 7 |

 **Public Members:**

* Get\_Data() to input Pname, Age and invoke Assign() function to assign the Category and no of events. Call the function Calpoints() to read the positions in

all the events and calculate the total points.

* Show\_Data() to display Pname, Category and TPoints.
1. Answer the questions (i) to (iv) based on the following: **4**

class Customer

{

 int CustNo;

 char CustName[20];

 protected:

 void Register();

 public:

 Customer();

 void Status();

};

class Salesman

{

 int SalNo;

 char SalName[20];

 protected:

 float Salary;

 public:

 Salesman();

 void Enter();

 void Show();

};

class Shop : private Customer, public Salesman

{

 char Voucher\_No[14];

 char Sales\_Date[8];

 public:

 Shop();

 void Sales\_Entry();

 void Sales\_Detail();

};

1. How many bytes will be required by an object belonging to class Shop?
2. Write the name of data member(s) which are accessible to object belonging to class customer.
3. Write the name of all the data members which are accessible to member functions of class Shop.
4. Write the name of all the member functions which are accessible to objects belonging to class Salesman.

Q3.

1. Write a function SWAP(int A[], int size) in c++ to modify the content of the array in such a way that the elements, which are multiples of 10 swap with the value present in the very next position in the array. **3**

For example:

 If the content of array A is

 80, 42, 41, 30, 24, 67

 The content of array A should become

 42, 80, 41 , 24 , 30, 67

1. Consider a 2D array containing n names. The array is sorted in alphabetical order. Write a function to locate a name by binary search. Display a message “name found” if the search is successful else display a proper error message. The array,its size and name to be searched are passed as arguments to the function.
2. A 2D array A[4..7][-1..3]requires 2 bytes of storage per element. If the array is stored in row major form. Calculate the address of A[6][2] if the base address is 100.
3. Consider the following portion of a program, which implements a linked stack for Library. Write the definition of functions PUSH () and POP() , to insert and delete a new node in the stack with required information.

struct Library

{ int id;

 char names[20];

};

class stack

{

 Library \*top;

 public :

stack()

 {

 top=NULL;

}

 void PUSH();

 void POP();

};

1. Write a function in C++ to find and return the sum of elements from all alternate elements of a two dimensional array passed as argument with size, starting from [0][0].

For eg

If the following is the content of the array

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

The function should add elements B[0][0], B[0][2], B[1][1], B[2][0] and B[2][2].

Q4.

1. What is the difference between ios :: app and ios:: ate file modes? **1**
2. Write a function in c++ to count the number of lines starting with article ***The*** from a text

 file NOTES.TXT. **2**

1. Given a binary file COMPUTER.DAT, containing records of the following type: **3**

class computer

{ int speed ;

char chipset[20]; //chipset as “PIV” or "QUADCORE or "DUALCORE”

**public:**

void Enter( ); //Function to enter the details . .

void Show( ); //Function to display the details

int checkchip(char ct[ ])

{ return strcmp(Chipset, ct); }

};

i) Write a function copy ( ) that would copy only those records having chipset as

 “DUALCORE” from “COMPUTER.DAT” to “NOTEBOOK.DAT”

1. Write a function append ( ) to append new records to the existing file “COMPUTER.DAT”.

Q5.

1. What do you understand by ***Degree*** and ***Cardinality*** of a table? Explain with example. **2**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. Consider the following tables Customer\_Record and Order\_Detail. Write SQL commands for statements (i) to (iv) and give output for SQL queries (v) to (viii) **6**

Table: Customer\_Record

|  |  |  |  |
| --- | --- | --- | --- |
| C\_Code | Name | City | Phone |
| C001 | Raju | Patna | 6837282 |
| C002 | Ali | New Delhi | 6763522 |
| C003 | James | Patna | 6912345 |
| C004 | Hari | New Delhi | 6354627 |
| C005 | Toms | New Delhi | 6644533 |

Table: Order\_Detail

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| O\_Code | C\_Code | Date | Item | Qty | Amount |
| A001 | C003 | 23-Nov-07 | Burger | 3 | 60 |
| A002 | C002 | 25-Nov-07 | Pizza | 2 | 300 |
| A003 | C005 | 30-Nov-07 | Burger | 5 | 100 |
| A004 | C004 | 03-Dec-07 | Burger | 5 | 100 |
| A005 | C001 | 15-Dec-07 | Hot Dog | 2 | 40 |

1. To display the name of all customers from Patna.
2. To display C\_Code, Name, Item, Qty and Amount for every customer.
3. To display Customer Detail in descending order of customer name.
4. To display City and number of customers from each city.
5. Select count (distinct city) from Customer\_Record;
6. Select A.name, B.item from customer\_record A, order\_detail b where a.c\_code=b.c\_code and a.city = ’New Delhi’;
7. Select O\_code, c\_code, qty, amount from order\_detail where item not in (‘Pizza’, Hot Dog’);
8. Select item, qty, o\_code from order\_detail where amount=60 or amount=40;

Q6. 1. State and prove Distributive Law algebraically. **2**
2. Draw the logic circuit diagram for the Boolean expression F=AB’+BC using **1**

only NAND gates.1. Express A’B+AC+BC in canonical SOP form.  **1**
2. Prove (P+R’)(P’+R)=PR+P’Q’R’+P’QR’  **2**
3. Reduce the following Boolean expression using K-Map:  **2**

 F(A,B,C,D) = Σ(0,1,4,5,8,10,12,14,15)Q7.  |
|  |   | (a) Differentiate between Package switching and message switching technique.  **1 1**(b) Expand: a) CDMA b) XML **1** **1**(c) Give **any two** examples of client Server Scripts. **1** **1** (d) Differentiate between Web Server and Web Browser.  **1** (e) A National Networking company is planning to start their offices in four cities of **4** UAE to provide regional IT infrastructure support in the field of Culture and Education. The company has planned to set up their head office in Abu Dhabi in three locations and have named their Abu Dhabi Offices as “Customer Support”, “Main Office” and “Maintenance office”. The company’s regional offices are located at “Dubai”, “Sharjah” and “Al Ain”.A rough layout of the same is as follows SharjahDubaiMain OfficeCustomer SupportMaintenance office Abu DhabiAl AinApproximate distance between these offices as per network survey team is as follows:

|  |  |  |
| --- | --- | --- |
| **From** | **To** | **Distance** |
| Main Office | Customer Support | 5 Km |
| Main Office | Maintenance Office | 1 Km |
| Main Office | Dubai Office | 180 Km |
| Main Office | Al Ain Office | 130 Km |
| Main Office | Sharjah Office | 225 Km |

In continuation of the above, the company experts have planned to install the following number of computers in each of their offices:

|  |  |
| --- | --- |
| Main Office | 110 |
| Customer Support | 25 |
| Maintenance Office | 55 |
| Al Ain Office  | 55 |
| Dubai | 55 |
| Sharjah | 55 |

1. Suggest network type (out of LAN, MAN, WAN) for connecting each of the following set of their offices:
	* Main Office and Maintenance Office
	* Main Office and Sharjah Office
2. Which device you will suggest to be procured by the company of connecting all the computers with in each of their offices out of the following devices?
* Modem
* Telephone
* Switch/Hub
1. Which of the following communication medium, will you suggest to be procured by the company for connecting their local offices in Abu Dhabi for distortion free, effective and fast communication?
* Telephone Cable
* Ethernet Cable
* Optical Fiber
1. Suggest a cable/wiring layout for connecting the company’s local offices located in Abu Dhabi. Also suggest an effective method/ technology for connecting the company’s regional offices “Al Ain”, “Dubai” and “Sharjah”.

(f) What is proprietary software? Give one example. **1** (g) Give one suitable example of each URL and Domain Name. **1** |
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