## SAMPLE PAPER-2013

CLASS-XII

**COMPUTER SCIENCE**

Time allowed: 3 hr.  MM: 70

1. (a) “While implementing encapsulation, abstraction is also implemented”. Comment 2

 (b) Name the header file to which the following functions belong: 1

 (i) itoa() (ii) getc()

 (c) Rewrite the following program after removing the syntactical errors (if any).Underline each correction: 2

class ABC

{ int x=10;

 float y;

 ABC() {y=10; }

 ~() {}

}

void main()

{

 ABC a1(10);

}

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

#include <iostream.h>

#include <string.h>

#include <ctype.h>

void swap(char &c1,char &c2)

{ char temp;

 temp=c1;

 c1=c2;

 c2=temp;

}

void update(char \*str)

{

 int k,j,l1,l2;

 l1 = (strlen(str)+1)/2;

 l2=strlen(str);

 for(k=0,j=l1-1;k<j;k++,j--)

 {

 if(islower(str[k]))

 swap(str[k],str[j]);

 }

 for(k=l1,j=l2-1;k<j;k++,j--)

 {

 if(isupper(str[k]))

 swap(str[k],str[j]);

 }

}

void main()

{

 char data[100]={"bEsTOfLUck"};

 cout<<"Original Data : "<<data<<endl;

 update(data);

 cout<<"Updated Data "<<data;

}

(e) In the following program, find the correct possible output(s) from the options and justify your answer: 2

#include <iostream.h>

#include <stdlib.h>

#include <string.h>

struct card { char suit[10];

 int digit;

 };

card\* cards = new card[52]; // Allocate Memory

void createdeck()

{ char temp[][10] = {"Clubs","Spades","Diamonds","Hearts"};

 int i,m=0,cnt=1;

 for(i=1;i<=52;i++)

 { strcpy(cards[i].suit,temp[m]);

 cards[i].digit=cnt;

 cnt++;

 if(i % 13 == 0)

 { m++; cnt=1; }

 }

}

card drawcard(int num)

{ int rndnum;

 randomize();

 rndnum = random(num)+1;

 return (cards[rndnum]);

}

void main()

{ createdeck();

 card c;

 c = drawcard(39);

 if(c.digit > 10 || c.digit == 1)

 {

 switch(c.digit)

 { case 11: cout<<"Jack of "; break;

 case 12: cout<<"Queen of "; break;

 case 13: cout<<"King of "; break;

 case 1: cout<<"Ace of ";

 }

 }

 else

 cout<<c.digit<<" of ";

 cout<<c.suit;

 delete[] cards; //Deallocate memory

}

Outputs:

i) Kind of Spades ii) Ace of Clubs

iii) Ace of Diamond iv) Queen of Hearts

(f) Give the output of the following program code: 2

#include <iostream.h>

strcut Pixel

{

 int c,r;

};

void display(Pixel p)

{

 cout<<”Col “<<p.c<<” Row “<<p.r<<endl;

}

void main()

{

 Pixel x = = {40,50}, y, z;

 z= x;

 x.c = x.c + 10;

 y = z;

 y.c = y.c + ;

 y.r = y.r + 20;

 z.c = z.c  15;

 display(x);

 display(y);

 display(z);

}

2.(a) How does the visibility mode control the access of members in the derived class? Explain with example. 2

(b) Answer the questions (i) and (ii) after going through the following class: 2

class player

{

 int health;

 int age;

 public:

 player() { health=6; age=18 } //Constructor1

 player(int s, int a) {health =s; age = a ; } //Constructor2

 player( player &p) { } //Constructor3

 ~player() { cout<<”Memory Deallocate”; } //Destructor

};

void main()

{

 player p1(7,24); //Statement1

 player p3 = p1; //Statement3

}

(i) When p3 object created specify which constructor invoked and why?

(ii) Write complete definition for Constructor3?

(c) Define a class Employee in C++ with the following specification: 4

Private Members:

• ename an array of char of size[50] ( represent employee name)

• deptname an array of char of size[20] ( represent department name)

• salary integer ( represent total salary of an employee)

• bonus float

• CalBonus() This function calculate the total bonus given to an employee according to following conditions

Deptname Bonus

Accounts 4 % of salary

HR 5% of salary

IT 2% of salary

Sales 3% of salary

Marketing 4% of salary

Public Members:

• Constructor to initialise ename and deptname to NULL and salary and bonus to 0.

• A function read\_info to allow user to enter values for ename, deptname,salary & Call function CalBonus() to calculate the bonus of an employee.

• A Function disp\_info() to allow user to view the content of all the data members.

(d) Consider the following code and answer the questions: 4

class typeA

{

 int x;

 protected:

 int k1;

 public:

 typeA(int m);

 void showtypeA();

};

class typeB : public typeA

{

 float p,q;

 protected:

 int m1;

 void intitypeB();

 public:

 typeB(float a, float b);

 void showtypeB();

};

class typeC : public typeA, private typeB

{

 int u,v;

 public:

 typeC(int a, int b);

 void showtypeC();

};

(i) How much byte does an object belonging to class typeC require?

(ii) Name the data member(s), which are accessible from the object(s) of class typeC.

(iii) Name the members, which can be accessed from the member functions of class typeC?

(iv) Is data member k1 of typeB accessible to objects of class typeB?

3 (a) Given two arrays A and B. Array ‘A’ contains all the elements of ‘B’ but one more element extra. Write a c++ function which accepts array A and B and its size as arguments/ parameters and find out the extra element in Array A. (Restriction: array elements are not in order) 3

Example

If Array A is {14, 21, 5, 19, 8, 4, 23, 11}

and Array B is {23, 8, 19, 4, 14, 11, 5 }

Then output will be 5 (extra element in Array A)

(b) Write a function in C++ which accepts an integer array and its size as arguments/parameters and assigns the elements into a two dimensional array of integers in the following format. 3

 if the array is 9,8,7,6,5,4 if the array is 1, 2, 3

The resultant 2D array is given below The resultant 2D array is given below

(c) Each element of an array DATA[10][10] requires 8 bytes of storage. If base address of array DATA is 2000, determine the location of DATA[4][5], when array is stored

 (i) Row-wise. (ii) Column-wise 4

(d) Write the function to perform push and pop operation on a dynamically allocated stack of customers implemented with the help of the following structure: 4

struct employee

{

 int eno;

 char ename[20];

 employee \*link;

};

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

 5, 11, , 6, 8, +, 12, \*, /

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

#include <iostream.h>

#include <fstream.h>

 void main(void)

{

 char filename[] = "C:\\testfileio3.txt";

 fstream inputfile, outputfile;

 int length;

 char \* buffer;

 // --------create, open and write data to file--------

 outputfile.open(filename, ios::out);

 // ----write some text-------

 outputfile<<"This is just line of text."<<endl;

 // --------close the output file------------

 outputfile.close();

 // ----opening and reading data from file-----

 inputfile.open(filename, ios::in);

 cout<<"The "<<filename<<" file was opened successfully!\n";

 cout<<"\nMove the pointer to the end\n"

 <<"Then back to the beginning with\n"

 <<"10 offset. The pointer now at...\n"<<endl;

 // flush the stream buffer explicitly...

 cout<<flush;

 // get length of file move the get pointer to the end of the stream

 inputfile.seekg(0, ios::end);

 // This statement returns the current stream position.

 length = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ //Statement1

 cout<<"length variable = "<<length<<"\n";

 // dynamically allocate some memory storage for type char...

 buffer = new char [length];

 // move back the pointer to the beginning with offset of 10

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ //Statement2

 // read data as block from input file...

 inputfile.read(buffer, length);

 cout<<buffer;

 // free up the allocated memory storage...

 delete [] buffer;

 inputfile.close();

 }

 (b) Assume a text file “coordinate.txt” is already created. Using this file create a C++ function to count the number of .words having first character capital.. 2

Example:

Do less Thinking and pay more attention to your heart. Do Less Acquiring and pay more Attention to what you already have. Do Less Complaining and pay more Attention to giving. Do Less criticizing and pay more Attention to Complementing. Do less talking and pay more attention to SILENCE.

Output will be : Total words are 16

 (c) Given a binary file “TABLE.TXT”, containing the records of the following class type

class perdata 3

{ int age;

 int weight;

 int height;

 char name[40];

 public:

 void getdata() { cin>>age>>weight>>height>>name; }

 void showdata() { cout<<age<<” “<<weight<<” “<<height<<” “<<name<<endl; }

 int retage()

 { return age; }

};

Write a function in c++ that would read contents from the file personal.dat and creates a file named eligible.dat copying only those records from personal.dat having age >= 18.

5. (a) What are the various levels of data abstraction in a database system? 2

 (b) Consider the following tables FACULTY and COURSES. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii)

FACULTY 6

F\_ID Fname Lname Hire\_date Salary

102 Amit Mishra 12-10-1998 12000

103 Nitin Vyas 24-12-1994 8000

104 Rakshit Soni 18-5-2001 14000

105 Rashmi Malhotra 11-9-2004 11000

106 Sulekha Srivastava 5-6-2006 10000

107 Niranjan Kumar 26-8-1996 16000

COURSES

C\_ID F\_ID Cname Fees

C21 102 Grid Computing 40000

C22 106 System Design 16000

C23 104 Computer Security 8000

C24 106 Human Biology 15000

C25 102 Computer Network 20000

C26 105 Visual Basic 6000

C27 107 Dreamweaver 4000

(i) To display details of those Faculties whose salary is greater than 12000.

(ii) To display the details of courses whose fees is in the range of 15000 to 50000

 (both values included).

(iii) To increase the fees of all courses by 500.

(iv) To display details of those courses which are taught by ‘Sulekha’.

(v) Select COUNT(DISTINCT F\_ID) from COURSES;

(vi) Select MIN(Salary) from FACULTY,COURSES

 where COURSES.C\_ID = FACULTY.F\_ID;

(vii) Select SUM(Fees) from courses

 Group By F\_ID having count(\*) > 1;

(viii) Select Fname, Lname from FACULTY

 Where Lname like “M%”;

6. (a) State and verify Distributive law in Boolean Algebra. 2

(b) Convert the following Boolean expression into its equivalent Canonical Product of Sum (POS) form. PQR + PQ’R + PQ’R’ + P’Q’R 2

(c) Obtain a simplified form for a Boolean expression 2

 F (a, b , c, d) = ∏ ( 0, 1, 3, 4, 5, 6, 7, 9, 10, 11, 13, 15) using Karnaugh Map.

(d) Represent the Boolean expression A’. (B+C) with the help of NOR gates only. 2

7. (a) What is gateway? 1

 (b) Write the two advantages and two disadvantages of Bus Topology in Network? 1

(c) Expand the following terms with respect to Networking. 2

i). PPP

ii). SMTP

iii). URL

iv). FDMA

(d) SunRise Pvt. Ltd. is setting up the network in the Ahmedabad. There are four departments named as MrktDept, FunDept, LegalDept, SalesDept.

Distance between various buildings is as given:

MrktDept to FunDept 80 m

MrktDept to LegalDept 180m

MrktDept to SalesDept 100 m

LegalDept to SalesDept 150 m

LegalDept to FunDept 100 m

FunDept to SalesDept 50 m

Number of Computers in the buildings:

MrktDept 20

LegalDept 10

FunDept 08

SalesDept 42

a) Suggest a cable layout of connections between the Departments and specify topology.

b) Suggest the most suitable building to place the server a suitable reason with a suitable reason.

c) Suggest the placement of Hub / Switch in the network.

d) Name the Department to place the modem so that all the building can share internet connection.