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CLASS XII –COMMON PREBOARD EXAMINATION 2015-2016

COMPUTER SCIENCE (083)

Time: 3 hours   Max. Marks: 70

Instructions:

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

(ii) Programming Language : C++

1. (a)   What is the difference between Local Variable and Global Variable?   2
          Also, give a suitable C++ code to illustrate both.

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

        1. isalnum ( )
        2. strcat( )

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

```
#include [iostream.h]
class MEMBER
{
int Mno;float Fees;
PUBLIC:
void Register(){cin>>Mno>>Fees;}
void Display{cout<<Mno<<" : "<<Fees<<endl;}
};
void main()
{
MEMBER M;
Register();
M.Display();
}
```

(d) Give the output of the following program 3

```
#include<iostream.h>
#include<conio.h>
void Execute(int &B, int C = 50)
{
int TEMP = B+C;
 B += TEMP;
if(C != 150)
cout << " "<<TEMP<<" " <<" "<< B <<" "<< C << endl;
        }
void main ( )
{
clrscr();
int M = 20, N = 10;
Execute(M);
cout <<" "<< M<< " "<<" "<< N << endl;
Execute(M, N);
cout <<" "<<M <<" "<< N << endl;
getch();
        }
```

(e) Find the output of the following Program. 2

```
#include <iostream.h>

#include <ctype.h>
void Encrypt(char T[])
{
  for (int i=0;T[i]!='\0';i+=2)
        if (T[i]=='A' || T[i]=='E')
        T[i]='#';
        else if (islower(T[i]))
         T[i]=toupper(T[i]);
        else T[i]='@';
}
void main()
{
char Text[]="a WeB SeRVEr";//The two words in the string Text
//are separated by single space
Encrypt(Text);
cout<<Text<<endl;
}
```

(f) Find the correct possible output(s) 2

```
#include<stdlib.h>
#include<iostream.h>
void main()
{
        randomize();
        char city[ ][5]={"DEL", "CHN", "KOL", "BOM", "BNG"};
           int ZEN;
        for(int i=0;i<3;i++)
        {
                ZEN=random(2)+1;
                        cout<<city[ZEN]<<"@";
        }
}
```
(i)   DEL@ CHN @KOL@
(ii)   CHN@KOL@CHN@
(iii)   KOL@BOM@BNG@
(iv)   KOL@ CHN @BNG@

2. (a) Differentiate between private and protected visibility modes in context of object oriented programming using suitable example illustrating each. 2

(b) Answer the questions (i) and (ii) after going through the following class: 2
```
class Cattle
{
   public:
     char category[20];
      Cattle( char  xname[] )              // function1
      {
          strcpy(category, xname)
      }
      Cattle(Cattle &t);              //function2
   };
```

    (i) Create an object, such that it invokes function1.
    (ii) Write complete definition for function2.

(c) Define a class Show in C++ with the description given below: 4
            Private Members:
            name_of_Show   of type character array(string)
            date_of_release   of type character array(string)
            name_of_director   of type character array(string)
            star   of type int
            total_print_release   of type int

3

Public Members:

A constructor to assign initial values as follows:

name_of_Show	NULL
date_of_release	1_1_2007
name_of_director	NULL
star	2
total_print_release	100

A function calculate_star() which calculates and assigns the value of data member Star as follows:

Total Print Release	Star
>= 1000	5
< 1000 & >=500	4
< 500 & >=300	3
< 300 & >=100	2
< 100	1

- A function EnterShow() to input the values of the data members name_of_Show, date_of_release, name_of_director and total_print_release and which invokes the function calculate_star( ).
- A function DisplayShow() which displays the contents of all the data members for a play.

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


```
Class Medicines
{
                char Category[10];
                char Dateofmanufacture[10];
                char Company[20];
public:
                Medicines();

                void entermedicinedetails();
                void showmedicinedetails();
} ;
class Capsules : public Medicines
{
        protected:
                char capsulename[30];
                char volumelabel[20];
        public:
```

```
        float Price;
        Capsules();
        void entercapsuledetails();
        void showcapsuledetails();
} ;
class Antibiotics : public Capsules
{
        int Dosageunits;
        char sideeffects[20];
        int Usewithindays;
public:
        Antibiotics();
        void enterdetails();
        void showdetails();
} ;
```

    (i) How many bytes will be required by an object of class Medicines and an object of class Antibiotics respectively?

    (ii) Write names of all the member functions accessible from the object of class Antibiotics.

    (iii)Write names of all the members accessible from member functions of class Capsules.

    (iv)Write names of all the data members which are accessible from objects of class Antibiotics.

3   (a) An array E containing elements of structure Employee is required to be arranged in descending order of salary. Write a C++ function to arrange the same with the help of Selection sort. The array and its size is required to be passed as parameters to the functions. Definitions of the structure is as follows: **3**

```
struct Employee
{
int empno;
char Ename[20];
float salary; };
```

   (b) An array S[40][30] is stored in the memory along the row with each of the element occupying 2 bytes, find out the memory location for the element S[20][10], if the Base Address of the array is 5000.   **3**

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

Assume the following definition of NODE for the same is

```
struct NODE
{
char Name[20];
NODE *Link;
};
```

(d) Write a function in C++ to find the sum of diagonal elements from a 2 dimensional   2
     array of type float. Use the array and its size as parameters with float as its return type.
     The function should count middle element of array only once.

(e) Evaluate the following postfix expression using a stack and show the contents of the   2
     stack after each operation.
     100, 40, 8, +, 20, 10, -, +, *

4   (a) Observe the program segment carefully and fill in the blanks marked as statement   1
          1&2

```
#include<fstream.h>

class MATERIAL

{

        int Mno;char Mname[25]; int qty;

        public:

        void ModifyQty();

};

void MATERAIL::ModifyQty()

{

        fstream File;
        File.open("MATERIAL.DAT",ios::binary|ios::in|ios::out);
        int Mpno;
        cout<<"Materail no to modify Qty :"; cin>>Mpno;
        while(File.read((char*)this,sizeof(MATERIAL)))
        {
        if(Mpno==Mno)
                {
                cout<<"Present Qty :" <<qty<,endl;
                cout<"Changed Qty :"; cin>>qty;
                int Position=_____; //(Statement 1)
                _____: //(Statement 2)
                File.write((char * this,sizeof (MATERIAL)); // Re-writing the
                record
                }
        }
        File.close();}
```

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(b) Assume a text file "coordination.txt" is already created. Using this file create a C++ 2
function to count the number of words having second character as small case vowel.

Example:

D**o** l**e**ss Thinking and p**a**y m**o**re attention t**o** y**o**ur h**e**art. D**o** L**e**ss Acquiring and p**a**y m**o**re Attention t**o** what y**o**u already h**a**ve. D**o** L**e**ss C**o**mplaining and p**a**y m**o**re Attention t**o** g**i**ving. D**o** L**e**ss criticizing and p**a**y m**o**re Attention t**o** C**o**mplementing. D**o** l**e**ss t**a**lking and p**a**y m**o**re attention t**o** SILENCE.

Output will be : <u>**Total words are 33**</u>

(c) Given a binary file SPORTS.DAT, containing records of the following 3
structure type :
struct Sports
{
char Event[20];
char Participant[10][30];
};

Write a function in C++ that would read contents from the file SPORTS.DAT
and creates a file named SWIMMING.DAT copying only those records from
SPORTS.DAT where the event name is "Athletics".

5. (a) Differentiate between candidate key and alternate key in context of RDBMS 2

(b) Consider the following tables EMPLOYEES and EMPSALARY. Write SQL commands for 4
the

statements(i) to (iv) and give outputs for SQL queries (v) to (viii).
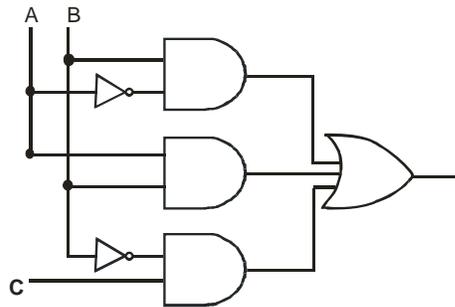
Books

Bookid	BookName	AuthorName	Publisher	Price	Type	Qty
C0001	Fast Cook	Lata Kapoor	EPB	355	Cookery	5
F0001	The Tears	William	First Publ	650	Fiction	20
T0001	My First C++	Brain & Brooke	EPB	350	Text	10
T0002	C++	A.W. Rossaine	TDH	350	Text	15
F0002	Thunderbolts	Anna Roberts	First publ	750	Fiction	50

Issued

Bookid	QtyIssued
T0001	4
C0001	5
F0001	2

i) To display Book name, author name and price of First publishers books.

(ii) To display the names and price of books in ascending order of their price.

(iii) To display bookid, bookname, type and qtyissued

(iv) To increase the price of all books of EPB publishers by 50.

(c) v. SELECT Count(*) FROM Books;   2

     vi. SELECT BookName , AuthorName FROM Books WHERE Publisher = "EPB";

     vii. SELECT COUNT(DISTINCT Publishers) FROM Books WHERE Price>=400;

     viii. SELECT MAX(Price) From Books WHERE Qty > 15;

6 (a) State and Verify DeMorgan's Law algebraically in Boolean algebra.   2

  (b) Write the equivalent Boolean Expression F for the following *circuit diagram* :   2

  (c) Convert the following Boolean expression into its equivalent Canonical Product of   1
     Sum form:

$$X.Y'.Z + X'.Y.Z + X'.Y.Z'$$

  (d) Obtain a simplified form for the following Boolean Expression using Karnaugh's Map   3
     $F(a,b,c,d)=\Sigma(0,1,2,4,5,7,8,9,10,11,14)$

7 (a) Distinguish between website and web browser.   1

  (b) What are the cookies?   1

  (c) What is difference between computer virus and computer worm?   1

  (d) **Expand the following terms in respect of networking:**   1

     i. FTP
     ii. PAN

  (e) What is the significance of Cyber Law?   1

(f) Define :   1
   (i) FLOSS
   (ii) OSI:

(g)   A company has to set up the network connection between the wings as per   4
           information given below:

Wing A to Wing S	100 meters
Wing A to Wing J	200 meters
Wing A to Wing H	400 meters
Wing S to Wing J	300 meters
Wing S to Wing H	100 meters
Wing J to Wing H	450 meters

Number of computers:

Wing A	15
Wing S	100
Wing J	5
Wing H	50

   i.   Suggest the most suitable topology for networking the computers of all the
         wings.

   ii.   Name the wing where the server should be installed. Justify your answer.

   iii. Suggest the installation place for Hub/Switch in the network.

   iv.   Mention the most economical internet connectivity accessible to all the wings