MARKING SCHEME

COMPUTER SCIENCE (083)_XII

2014-15

SECTION – A

Q. 1.a Ordinary function : These are function define anywhere in the program and called directly using function name.

Example

```
void cube (int x)
{
cout << x * x * x;
}
void main()
{
int a;
cin>>a;
cube (a); //Function call.
}
```

Member function : These are function define inside the class and called using object.

```
class A

{ int x;

public:

void cube ()
{
    cout << x * x * x;
}
___
-----
};
void main ( )
 {       A1;
         =
        A1.cube( ); //Function call
}
```

(½ Mark for each correct explanation and ½ Mark for each correct example of ordinary and member function)

b. (i) getchar ( )

(ii) isalnum ( )

(½ Mark for writing each correct library function name)

c. # include < iostream.h >

include < math.n >

```
# define PI  3.14
void main()
{
float r, a;
cout << "enter any radius " ;
cin >>r;
a = pI * pow (r, 2);
cout << "Area =" << a ;
}
```

(½ Mark for each correction).

d. Text = tMKCM@lMJGCR

New Text = CM@lMJGCR

last Text = lMJGCR

[1 Mark for first line
½ Mark for second line
½ Mark for third line]

e. 5 : B : 55

1 : B : 50

5 : C : 85

[1 Mark for each correct line of output]

f. (iii) O – R – A – G –

Minimum L value – 5

Maximum L value – 8

[1 Mark for correct option ½ Mark for each min and max value of L]

Q. 2. a Encapsulation : Wrapping up of data and associated function into a single group is called encapsulation.

Abstraction : Act of representing essential feature without including background detail is called abstraction.

In C++ encapsulation is implemented by using class and abstraction is implanted by using private access mode.

Ex.

```
class Stu
```

```
   {              int rollno;
Abstraction   char name[20];
              float fees;
                                        Encapsulation
              public:
                   void input ( );
                   void output ( );
     } ;
```

[½ mark for each correct defn, and ½ mark for example]

b. Constructor overloading

```
void stream : : Steam (int Sc, char S[], float f)
{ streamcode = Sc;
strcpy (streamname, S);
fees = f;
}
```

[½ Mark for constractor overloading]

(½ Mark for defn.)

ii) Statement 1 – implicit call

Statement 2 – Explicit call

Implicit call – It will not create temporary object.

Explicit call – It will create temporary object with class name.

[½ mark for each correct name]

c.

```
class customer
{ private :
      int customer _ no;
      char customer_name [20];
      int Qty;
      float price, Totalprice, Discount, Netprice;
public :
  customer()
  {
      customer_no=111;
      strcpy (customer_name, “Leena”);
      Qty = 0;
      Price = Totalprice = Netprice = Discount = 0;
}
void input ( )
```

```
{ cout <<"Enter customer_no ,Customer_name, Qty and Price";
cin>>customer_no;
gets (Customer_name);
cin>> Qty;
cin>>prices;
Caldiscount( );
}
void Caldiscount ( );
void show ( )
{ cout << "customer_no : "<<customer_no;
  cout << "\n name : "<<customer_name;
  cout << "\n prince : "<<price;
  cout << "\n Qty : "<< Qty;
  cout << "\n Total price : "<<Totalprice;
  cout << "\n Discount : "<<Discount;
  cout << "\n Net price : "<< Netprice;
}
};
void  customer : : Caldiscount( )
{
Totalprice = price * Qty;
if (Totalprice > = 50000)
        Discount  = 25 * Totalprice / 100;
else if  (Totalprice > = 25000)
        Discount = 15 * Totalprice / 100;
else
        Discount = 10 * Totalprice / 100;
}
```

(½ mark for correct syntax for class header)

(½ mark for correct declaration of data members)

(½ mark for correct defn. of customer ( ))

(½ mark for correct defn. show ( ))

(1 mark for correct defn. Caldiscount ( ))

(1 mark for correct defn input () with proper invocation of caldiscount ( ))

c (i) Dealer – 118

Accessories – 94

(½ mark for each correct bytes)

(ii) Multilevel inheritance

Base class – AC

Derived class – Dealer

[½ mark for correct option]

[½ mark for correct base and derived class name]

(iii)Data member	**Member function**
Price	enteraccessoriesdetails ( )
	showaccessoriesdetails ( )
	enterdetails ( )
	showdetails ( )

[½ mark for correct Data Members]

[½ mark for correct member functions]

iv)	**Data member**	**Member function**
	Price	enterdetails ( )
	No_of_dealers	showdetails ( )
	Dealers_name	enteraccessoriesdetails ( )
	No_of_products	showaccessoriesdetails ( )
	Stabilizer	entercarddetails ( )
	AC_Cover	voidshowcarddetails ( )

(½ Mark for correct Data members)

(½ Mark for correct member functions)

Q.3. a) m = 37

n = 18

w = 4 bytes

$I_o = -1$

$J_o = -2$

$T [I] [J] = B + W [(I – I_o] n + (J – J_o)]$

T [2] [2] = 3000

T [20] [5] = ?

T [2] [2] = B + 4 [2 – (-1) x 18 + (2 – (-2))]

3000 = B + 4 [3 x 18 + 4]

= B + 4 [54 + 4]

= B + 4 [58]

3000 = B + 232

B = 3000 – 232

= 2768

T [20] [5] = 2768 + 4 [(20 – (-1) x 18 + (5 – (-2)]

= 2768 + 4 [21 x 18 +7]

= 2768 + 4 [378 + 7]

= 2768 + 4 x 385

= 2768 + 1540

= 4308

Total number of elements = 37 x 18 = 666

Total bytes = 4 x 666 = 2664 bytes

[1 mark for correct formula]

[½ mark for finding base address]

[½ mark for finding correct address]

[½ mark for total number of elements]

[½ mark for total bytes]

b)

```
void SORTSCORE (IPL  I [], int  n )
{ int i, POS, j;
 IPL small, temp;
for ( i = 0; i < n-1; i + + )
{ POS = i;
small = I [ i ];
for ( j = i + 1; j < n; j + + )
{
if  ( I [ j ] . score > small.score)
{ POS = j;
  Small = I [ j] ;
}
  temp = I [ i ];
   I [ i ] = I [ POS ] ;
   I [ POS ] = temp ;
}
}
}
```

[½ mark for correct function Header]

[1 mark for correct for loops]

[1 mark for interchanging numbers]

[½ mark for changing small value]

c)

```
struct Game
{ char Gamename [30];
int numberofplayer;
Game * next;
};
class stack
{
Game * temp, * top;
public :
        stack ( )
        { top = NULL;
        }
         void  POP ( ) ;
         void push ( ) ;
};
void   stack : : POP ( )
{       if ( top =  = NULL)
            cout << “Stack empty”;
        else
        { temp = top;
        top = top ->next;
        delete (top);
        }
}
void    stack : : push ( )
{
           temp = new (Game);
           cin >> temp->Gamename;
           cin >> temp->numberofplayer ;
           temp->next = top;
           top  = temp;
}
```

(½ mark for class defn.)

(½ mark for constructor with top = NULL)

(1 ½ mark for push function)

1 ½ mark for POP function)

d)

```
void      sumnegative (int A [ ] [10], int n )
{         int  s = 0, i, j ;
          for (i = 0; i < n;  i++)
          {
              for ( j = 0;  j <n; j++)
               {
                   if ( ( i  ==  j ) && (A[i][j] <0))
                       s + = A [ i ] [j] ;
                    if ( ( i+j  == n-1j ) && (A[i][j] <0))
                       s + = A [ i ] [j] ;
               }
          }
          cout << " Total = " <<s;

}
```

(½ mark for for loop)

(½ mark for checking i == j , i + j == n – 1 and A[i][j]<0)

(½ mark for finding sum)

(½ mark for display sum)

e) 2 , 13, +, 5, -, 6, 3, /, 5, *, <

STACK	**OPERATOR**
2	
2, 13	
15	+
15, 5	
10	-
10, 6	
10, 6, 3	/
10, 2, 5	*
10, 10	<
0	

Output 0 (False)

[½ mark for finding result upto '+' operator

½ mark for finding result upto '-' operator

½ mark for finding result upto '/' operator

½ mark for finding result upto '<' operator]

[2 marks for correct answer with proper step]

[½ mark for only correct answer]

Q. 4. a) file . seekp (9 * sizeof (STUDENT), ios : : beg) ;

file . seekp (3 * sizeof (STUDENT), ios : : beg);

(½ mark for each correct statements)

b)

```
void counthree ( )
{     ifstream infile ( " VOWEL . TXT");
       char  c [ 20 ]; int  count = 0;
        if  ( ! infile )
              cout << "Not exist";
         else
         { infile . getline ( c, 20, '   ' );
           if  (strlen (c ) ==  3)
                count + + ;
          }
              cout << "Total count =" << count;
}
```

(½ mark for opening file)

(½ mark for reading string)

(½ mark checking and counting number of 3 character words)

(½ mark for printing count)

c)

```
void fun ( )
{  CAR C;
   ifstream infile ( " CAR.DAT" , ios :  : binary) ;
   if ( ! infile )
      cout < < " not exit " ;
   else
   {    while (infile. read (( char * ) &C, sizeof(C )))
   {
        if ( C. RETURN_Milage () > = 100  && C. RETURN_Milage( ) < = 150)
            C. display ( );
   }
```

```
  }
}
```

(1 mark for opening CAR.DAT correctly)

(½ mark for reading records)

(½ mark for comparing millage)

(1 mark for displaying record)

SECTION – B

Q.1 a)

Static Method	Instance Method
i) are declared with keyword static	No keyword required
ii) self is not required as first argument	first argument to function is 'self'
iii) invoked using class qualifier	invoked using method qualifier
iv) faster in execution	slower in execution
v) example	Example

(½ mark each for any 2 correct points of comparison)

b) i) search(), find ( ), findall ( ) of string module.

(½ mark for any correct method name)

(No marks to be deducted for not mentioning module name)

ii) index ( )

(½ mark for the correct function name)

c) import math OR from math import pow

def main ( ):

_____ r = float (raw_input ('enter any radius :')

_____ a = 3.14 x math.pow (r, 2) OR a = 3:14 * pow (r, 2)

_____ print "Area = " , a

(½ mark for each correction done. ½ * 4 = 2 for any 4 corrections. Similar type of correction are to be considered one).

(deduct ½ mark for not underlining the corrections)

(Any other correct solution should be considered)

d) 3

The expression will be x = x + x – x, substituting value of x as 3 we get 3 + 3 – 3 which is 3.

(1 mark for correct answer)

(1 mark for correct justification)

e) 52

Age is assigned value 50, and dictionary contains two elements id & age, so sum is 52.

(1 mark for correct answer)

(2 mark for correct justification)

f) (iii) option , max value = 8, min value 5,

(1 mark for correct option number or option answer)

(1 mark for correct justification)

Q.2. a) Encapsulation : Wrapping up of data and associated function into a single group is called encapsulation.

Abstraction : Act of representing essential feature without including background detail is called abstraction.

Example

```
class stu (object) :              # data abstraction
    _|
    def __init__(self):
        self.rollno = 0           # indentation is used for encapsulation
        self.name= ‘ ’
        self.fees = 0.0

    def  input (self) :
        self.rollno = input ( )
        self.name = raw_input ( )
        self.fees   = input ( )

    def output (self) :
        print self.rollno
        print self.name
```

```
        print self.fees
```

(½ mark each for correct definition)

(½ mark each for specification of abstraction and encapsulation in example)

b)

A

B

F

A is 'print A' lies outside try……..except statement it will always be executed.

B is printed as it is first statement of try

Calculation of 'a' results in run time error (division by 0) so clause ZeroDivisionError is executed, hence value F is printed

(½ mark for first two statement)

(½ mark for last statement)

(1 mark for justification)

c)

```
class customer(object):
    def __ init__ (self) :
        self.customernumber = 111
        self.customername = 'Leena'
        self.qty = 0
        self.price,self.discount, self.netprice = 0, 0, 0
    def caldiscount(self):
        self.totalprice = self.price*self.qty
        if  self.totalprice> = 50000:
```

```
            self.discount = 0.25
        elif  25000 > = self.totalprice < 50000 :
            self.discount = 0.15
        else :
            self.discount = 0.10
        self.netprice = self.totalprice * self discount
    def input(self):
        self.customername = raw_input ('enter customer name :')
        self.customernumber = input ('enter customer no.)
        self.qty = input ('enter quantity')
        caldiscount( )
    def show(self ) :
        print "customer number is :", self.customernumber
        print "customer name is :", self.customername
        print "quality purchased :", self.qty
        print "price of item :", self.price
        print "net price is :", self.netprice
```

(1 mark for correct syntax of class)

(½ mark for correct definition of init function)

(½ mark for correct definition of show ( ))

(1 mark for correct definition of input ( ) with proper invocation of caldiscount())

(1 mark for correct definition of caldiscount())

d) Example

```
class Base(object) :
    def __init__(self) :
        self.a = 0
        self.b = 0
class derived (Base):
    def __init__(self):
        super (Base, self)__ init__(self)
        self.c=0
```

Example

```
class Base(object):
    def __ init__ (self) :
        self.a = 0
        self.b = 0
class derived (Base) :
    def __ init__(self):
        Base.__ init__(self)
        self.c=0
```

(1 mark for either explanation / usage the super ( ))

(1 mark for proper explanation / usage of Base class method with base class id)

e)

```
import math
def lsum (list) :
    sum = 0
    try :
```

```
        for val in list :
            sum + = math.sqrt (val)
    except ImportError :
            print “you forgot to import math module”
    except TypeError :
            print “list contains non numeric values”
    finally :
            return sum
```

(½ mark for correct function header)

(½ mark each for correctly checking Import Error & Type Error)

(½ mark for return of sum, in any way)

Q.3.a) **Bubble sort**

1st pass : - 40, -23, 11, 27, 38, -1, 67

2nd pass : - -23, 11, 27, 38, -1, 40, 67

3rd pass : - -23, 11, 27, -1, 38, 40, 67

Selection Sort

1st pass : - -23, 67, 40, 11 27, 38, -1

2nd pass : - -23, -1, 40, 11, 27, 38, 67

3rd pass : - -23, -1, 11, 40, 27, 38, 67

(½ mark for each correct pass)

b) def bsearch (list, val):

```
lb  = 0
ub = len(list)  - 1
while lb < = ub :
        mid  =  (lb + ub) / 2
        if list [mid] = = val :
            return 1
         elif  list[mid] < val :
              lb = mid + 1
         else :
              ub = mid – 1
       return 0
```

(½ mark for definition of lb & ub)

(½ mark for correct re-definition of lb & ub)

(½ mark for correct loop)

(½ mark for returning correct value)

(any alternative code giving correct answer is acceptable)

c)

```
class stack(object) :
        S = [ ]
        def push (self, data):
            stack.S.append(data)
        def pop (self) :
            return stack.S.pop( )
```

(½ mark for class header)

(½ mark for list creation)

(½ mark for each for member function header)

(1 mark each for function statement)

d)

```
import math
def is_prime (numb) :
    if numb > 1 :
        if numb == 2 :
            return True
        if numb % 2 == 0 :
            return False
        for i in range (3, int(math.sqrt(numb) + 1), 2) :
            if numb % i == 0 :
                return False
        return False
def get_primes (num) :
        while True :
            if is_prime(num):
                yield num
            num + = 1
```

(½ mark for checking constant 1 & 2)

(½ mark for eliminating even numbers)

(1 mark for checking of an odd number)

(1 marks for correctly using yield statement)

e) 2 , 13, +, 5, -, 6, 3, /, 5, *, <

STACK	OPERATOR
2	
2, 13	
15	+
15, 5	
10	-
10, 6	
10, 6, 3	/
10, 2, 5	*
10, 10	<
0	

Output 0 or False

(½ mark for finding result upto '+' operator)

(½ mark for finding result upto '-' operator)

(½ mark for finding result upto '/' operator)

(½ mark for finding result upto '<' operator)

(2 marks for correct answer with proper step)

(½ mark for only correct answer)

Q.4.a) write ( ) is used to write a string in the text file

writelines ( ) is used to write a string, list, tuple or dictionary in the data file.

(1 mark for correct difference or its representation through example)

b)

```
def  carfile():
    ifile   = open ('car.txt', 'r')
    line  = ifle.readline()
    while line  :
        x = line.split ( )
        if      100 > = x [ 2 ] < = 150 :
            print  line
        line   = ifile.readline()
    ifile.close()
```

(½ mark for reading aline from the file)

(½ mark for loop)

(½ mark for splitting the content of string rcad from the file)

(½ mark for correct comparison & printing)

c)

```
def fileprocess ( ) :
    import pickle
    list  = [ ]
    sum = 0
    count = 0
    file  = open ( ' log.dat', 'rb')
    List = pickle.load (file)
    for i in List :
```

```
        x = i.split()
        if x[0].find('xerrox') == 0  :
            y = float(x [1])
            sum +  = y
            count +  = 1
    avg  = sum / count
    print avg,  count
```

(½ mark for loading the file)

(½ mark for the loop)

(½ mark for comparsion)

(½ each for sum and avg calculation)

(½ mark for print)

SECTION – C

Q.5. a) Degree ⟶ number of columns in a table

Cardinality ⟶ number of rows in a table.

Degree – 4

Cardinality – 5

(½ mark each for correct concept of degree and cardinality)

(½ mark each for correct degree and cardinality value)

b) (i) Select comname

from company, customer

where company. CID = customer . CID

and price < 30000;

[½ mark for First two line and ½ mark for where clause]

(ii) select name
from company
order by name desc;

[½ mark for select and from and ½ mark for order by command]

(iii) update customer
set price = price + 1000
where name like ‘ S% ’ ;

[½ mark for update and set and ½ mark for where clause]

(iv) Alter table customer
Add totalprice decimal (10, 2);

[½ mark for First line and ½ mark for second line]

(v)

Count(*)	CITY
3	DELHI
2	MUMBAI
1	MADRAS

[½ mark for correct answer]

(vi) MIN (PRICE) MAX (PRICE)
50000 70000

[½ mark for correct answer]

(vii)

AVG (QTY)
11

[½ mark for correct answer]

(viii) **PRODUCT NAME** **CITY** **PRICE**
MOBILE MUMBAI 70000

MOBILE MUMBAI 25000

[½ marks for correct answer]

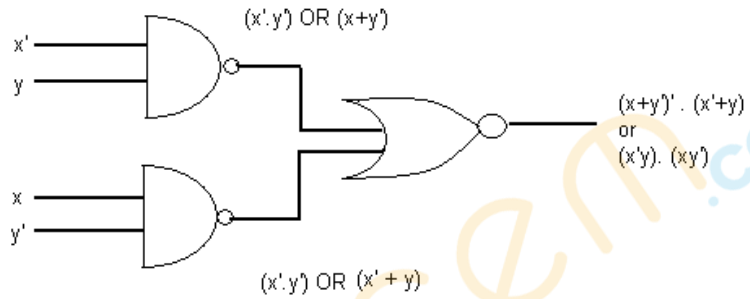
Q. 6 a) Principle of duality states that any theorm / identiyt / statement in Boolean algebra remains true if identity element (0,1) and operators (+, .) are swapped.

Importance – It is sufficient to prove one part of them / idenity / statement).

(1 mark for correct definition or an example depicty the correct definition)

(1 mark for its importance represented in any way)

b)



(x + y')'.(x'+y)'

OR

(x'y).(xy')

(½ mark each for correct expansion fo NAND gate)

(1 mark for the term of NOR gate)

c)

Π (0, 1, 4, 7, 8, 9, 12, 13, 14)

OR

M0 M1 M4 M7 M8 M9 M12 M13 M14

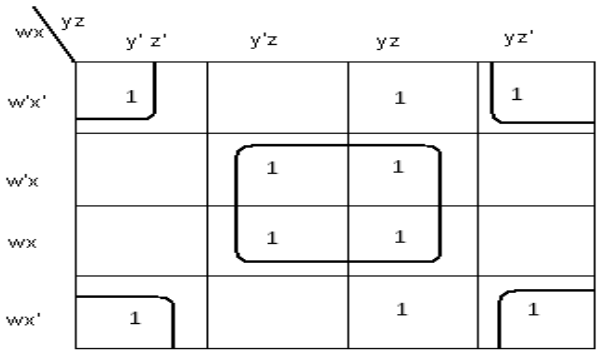
OR

(a+b+c+d) . (a+b+c+d') . (a+b'+c+d) . (a+b'+c'+d) . (a'+b+c+d) . (a'+b+c+d') . (a'+b'+c+d') . (a'+b'+c+d') . (a'+b'+c'+d)

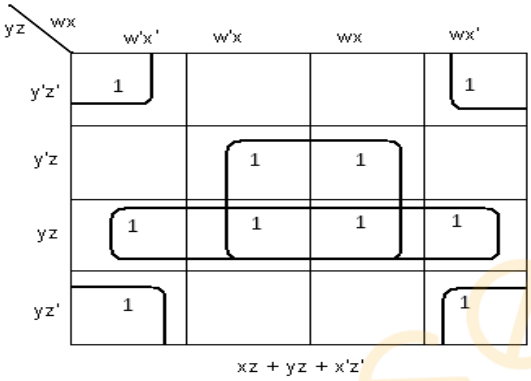
(1 mark for correct answer)

(½ for mentioning correct five term)

d)



OR



(1 mark for correct k-map and representation of function)

(1/2 mark for two correct groups, 1 for all 4 groups)

(1 mark for correct answer. ½ mark for two correct terms)

Q.7. a) <u>Optical Fibres</u>

(i) It is immune to electrical and magnetic interference

(ii) It is highly suitable for harsh industries environments

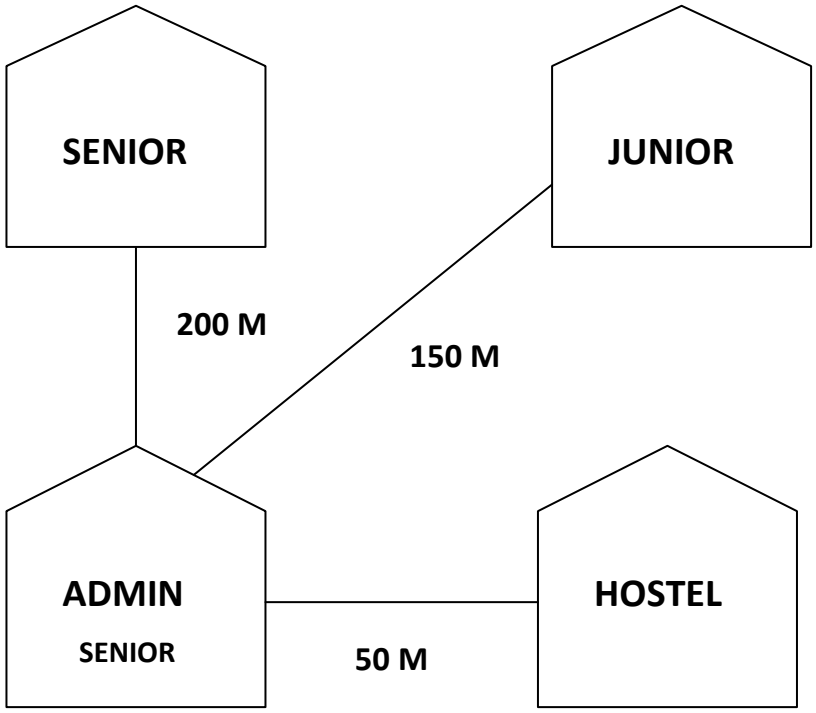
(iii) Very high transmission capacity

(iv) Secure transmission

(v) It is used for broadband transmission.

[Any two option - 1 mark]

b) b 1)



[1 mark for correct layout]

b 2)

ADMIN – because more number of computers

[½ mark for suitable place and ½ mark for suitable reason]

b 3)

Repeater ⟶ admin to senior

Hub / Switch ⟶ all building

[½ mark for repeater and ½ mark for switch / Hub]

b 4)

Radio wave.

[1 mark for correct option]

c) URL ⟶ http :// www.income .in / home.aboutus.html

Domain name ⟶ www.income.in

[1/2 mark for URL and ½ mark for Domain name]

d) Web Hosting : web hosting is the process of uploading / savig the web content on a web server to make it available on www.

[1 mark for correct answer]

e) Circuit Switching Packet Switching

- Complete physical connection is established between nodes	- No physical connection is established
- No fixed size	- Fixed Size

[Any two correct difference 1 mark (i.e.) ½ mark each]

f) Firewall is hardware or software based network security system. It prevents unauthorized access to or from a network.

[1 mark for proper defn.]

e) Telnet.

[1 mark for correct protocol]