Dept of Electronics&Communications   **First Year**
Data Structure   Classes   **Sheet #4**
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[1] Show the output display of the following programs:

a)   class Adder {   private : int y[10],n,index, total ;
                    public :
     Adder (int i = 0) { total = i; n=0;index=0;}
     void addNum ( ) { for(int i=0;i<n;i++)total += y[i];   }
     int getTotal ( )   { return total;   }
               void put(int b){ y[index]=b;n++; index++;   }
               int max(){int x=y[0];for(int i=0;i<n;i++) if(y[i]>x)
                    x=y[i]; return x;   }};

          int main ( )
         { Adder a;
          a.put(10); a.put(20);a.put(5);a.put(30);a.put(15);
           a . addNum ();
           cout << "Total : "<<a.getTotal ( )<< endl;
             cout<<" Maximum " <<a.max(); return 0 ; }

```
Total: 80
Maximum 30
```

b) class testClass
{ int Cno,total; char section;
public:
testClass(int n=1)
{ Cno=n; section='A'; total=30; }
void admission (int c=20)
{section++; total+=c; }
void ClassShow ()
{cout<<Cno<<":"<<section<<":"<<total<<endl; }};
 main ()
{testClass C1(5) ,C2;
C1.admission(25); C1.ClassShow( );
C2.admission( ) ;   C1.admission(30);
C2.ClassShow( ); C1.ClassShow( ); }

```
5 : B : 55
1 : C : 50
5 : C : 85
```

   c)   class array {   int a[10];
        public: int length;
             int get(int index) {return a[index];   }
             void set(int index, int val) { a[index] = val; length++;   } } ;

   main( )
      { array L1,L2; cout<<" creat new arrays "<<endl;
       L1.length=0; L2.length=0;
        L1. set(0,1); L1.set(1,1); L1.set(2,4); L1.set(3,20);
        L2.set(0,10); L2.set(1,30);   L2.set(2,50);
       cout<<" length of array 1   "<<L1.length<<endl;
       cout<<" length of array 2   "<<L2.length<<endl;
         cout<< L1.get(2)<<"   "<<L1.get(3)<<endl;
      cout<<L2.get(0)<<"   "<<L2.get(2)<<endl;   }

```
create new arrays
.......4
........ 3
4      20
10      50
```

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

```
class Travel
{ int PlaceCode; char Place [20] ;
float Charges;
public :
Travel ( )    //Function 1
{PlaceCode = 1; strcpy (Place, "Cairo); Charges =100;  }
void TravelPlan (float C)
//Function 2
{cout<<PlaceCode<< ":" <<Place<< ":" <<Charges<<endl; }
- Travel ( )   //Function 3
{cout<<"Travel Plan Cancelled"<<endl;  }
Travel (int PC, char P [], float C)
                 // Function 4
{PlaceCode = PC; strcpy (Place, P);
Charges = C;  } } ;
```

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class can have multi constructor differ according to parameters

(i) In Object Oriented Programming, what are Function 1 and Function 4 combinely referred to as ?   *constructor of the class*

(ii) In Object Oriented Programming which concept is illustrated by Function 3? When is this function called/invoked ?   *destructor -> clean up the space of the object*

[3] Rewrite the following program after removing the syntax errors (if any). Under line each correction.

```
#include <iostream.h>
Class Item                           c
{ long  k1, k2;                        int add() {return k1+k2;}
public :         ()
void Purchase {cin>>k1>> k2;}                              }
int add ( return k1+k2;)
void sale ()  { cout<<" value 1 :  "<< k1<<" value 2    :"<k2<<endl; };
void main ()
{  Item I1, I2;                                    <<
Purchase ();            l1.purchase();   l2.purchase();
cout<<l1.k1<<l1.k2<<endl;      error cant print priate data
cout<<l2.k1<<l2.k2<<endl;
I1. Sale () ;  I2. Sale ()
    cout<<" new  "<<add( ); }
```

public not private

sale();   l1.add();

[4] Show the output display of the following program and conclude your answer:

```
class state
{ private: string state_name;  int size;
public:  state() { size = 0; state_name = " any string ";}
  void get( ) { cin>>state_name ; size = state_name.length();   }

void display()
{ cout<<"  string "<<state_name<<" with size "<<size<<endl; }
```

```
void Replace(state &a,state &b)
{   string s= b.state_name;
b.state_name=a.state_name;
a.state_name +=s;
size = a.size + b.size;   }  };


main()
{  state  S1, S2, S3;                    .
S1.get();S2.get();
 S1.Replace(S1, S3);S1.display();

S2.Replace(S2,S1);  S2.display();  }
```

assume input is
omar
ahmed

omar 4

ahemdomar 9

[5] Construct the class person that contains:

Name as string, age as integer, salary as float, and the two functions:
Void enter( )   to read data of any person
Void report( )   to print the information of any pereson
Then write a main program that use class to construct the data base of 10 persons
and print the information of any required one.
Write a recursive function that obtains the sum of first n elements of an array of
integers.

[6] Create a base class basic_info with data members name ,roll no, sex, height
and weight and two member functions getdata( ) and display( ).
Creat an array of objects of the class , enter data and display all the information
using object of derived class.

[7] Construct the class **Vector**, that represents a one dimensional array **A** of maxsize
N that contains integer elements. The class includes the following member
functions:
    i) **void insert_value(int value)**   : that insert **value** at the end of the array and
    modify the size of the array.
    ii) **void print (int i)**   : to print the element at the index i .
    iii) **void add(Vector B)**   :to add array B to the array A.
    Then write a main program that declars two objects of the class **Vector** A, B,
    inserts 10   values in each array, adds the two arrays, then search for certain
    element in the array A and delete it with required modification of the array.
    Print the elements of array A. Write all the member functions of the class.