INTRODUCTION TO SCIENTIFIC AND ENGINEERING COMPUTING

SAMPLE FINAL EXAM

Q.1) Two integers are said to be amicable or friendly if each number is the sum of all the possible divisors of the other. One such pair is 220 and 284. Since the possible divisors of 220 are 1, 2, 4, 5, 10, 11, 20, 22, 44, 55, and 110 which sum to 284 and the possible divisors of 284 are 1, 2, 4, 71, and 142 which sum to 220, then 220 and 284 are said to be friendly. Find a pair of friendly numbers such that both integers are greater than 1100 and less than 1300.

Q.2) Write a function which takes two integers and returns true if the first integer can be written by using the digits of the second integer:

    bool isPossible(int m,int n);

Q.3) Write a function which takes an integer array and returns the index of most frequently repeated element.

Example: For the following array

    int array[]= {1,3,2,8,7,5,2,6,9,2,7} ;

the function should return 2. Because array[2] is repeated *three* times.

Q.4) Write a function which takes an integer array and then sorts its even and odd elements separately.

Example: For the following array

    int array[]= {1,3,2,8,13,7,5,6,9,10,11} ;

after the function is called, the array elements are rearranged as the following

    {1,3,5,7,9,11,13,2,6,8,10}

Q.5) What is wrong with the following function? Explain why? How can you fix the problem?

```
int* function(){
    int a[10];
    ...
    return a;
}
```