Due Date: 23-12-2021   **Instructor:** *Najmun Nisa*   *Class: BSSE-7*   ***Marks:*** *30*

Question1:

Why we need test framework w.r.t test tools? Mention any test framework for writing test cases with some particular example.

Question2:

Consider the following example class. PrimeNumbers has three methods. The first, computePrimes(), takes one integer input and computes that many prime numbers. iterator() returns an Iterator that will iterate through the primes, and toString() returns a string representation.

```java
public class PrimeNumbers implements Iterable<Integer>
{
  private List<Integer> primes = new ArrayList<Integer>();

  public void computePrimes (int n)
  {
    int count = 1; // count of primes
    int number = 2; // number tested for primeness
    boolean isPrime; // is this number a prime
    while (count <= n)
    {
      isPrime = true;
      for (int divisor = 2; divisor <= number / 2; divisor++)
      {
        if (number % divisor == 0)
        {
          isPrime = false;
          break; // for loop
        }
      }
      if (isPrime && (number % 10 != 9)) // FAULT
      {
        primes.add (number);
        count++;
      }
      number++;
    }
  }

  @Override public Iterator<Integer> iterator()
  {
    return primes.iterator();
  }


    @Override public String toString()
    {
      return primes.toString();
    }
}
```

computePrimes() has a fault that causes it not to include prime numbers whose last digit is 9 (for example, it omits 19, 29, 59, 79, 89, 109, . ..). If possible, describe five tests. You can describe the tests as sequences of calls to the above methods, or briefly describe them in words. Note that the last two tests require the test oracle(A test oracle is a mechanism for predicting the expected results. The specification can serve as a test oracle.)to be described.

(a) A test that does not reach the fault
(b) A test that reaches the fault, but does not infect
(c) A test that infects the state, but does not propagate
(d) A test that propagates, but does not reveal
(e) A test that reveals the fault

If a test cannot be created, explain why.