QUESTIONS

1. Consider the following procedure and answer these questions:
a) Suppose that `if ( x < y )` line is mutated to `if ( x <= y )`. Generate a test case that will distinguish this mutant.
b) Suppose that `if ( x < y )` line is mutated to `if ( x < y + 1 )`. Generate a test case that will distinguish this mutant.
c) Suppose that `return x * y;` line is mutated to `return x / y;`. Generate a test case that will distinguish this mutant.

```
begin
      int x, y;
      input (x, y);
      if ( x < y )
            return x + y;
      else
            return x * y;
end
```

2. Consider the following predicate: $(\boldsymbol{a} > \boldsymbol{b}) \wedge \neg \boldsymbol{c} \wedge \neg(\boldsymbol{d} = \boldsymbol{e}) \vee (\boldsymbol{f} \leq \boldsymbol{g})$, where *a*, *b*, *d*, *e, f* and *g* are integer variables and *c* is a Boolean variable.
a) Use the **BRO-CSET** procedure to derive the constraint set for this predicate.
b) Generate test cases for the constraint set you have derived in **a)**.

3. Consider the following procedure and answer these questions:
a) Generate a test set that is adequate with respect to statement coverage.
b) Specify additional test(s) that should be added to the test set generated in a) to make it adequate with respect to decision coverage
c) Specify additional test(s) that should be added to the test set generated in b) to make it adequate with respect to condition coverage.

```
int proc(int a, int b, int x) {
      if ( ( a > 1 ) && ( b == 0) ) {
            x = x / a;
      }
      if ( ( a ==2 ) || ( x > 1 ) ) {
            x = x + 1;
      }
      return x;
}
```

4. Consider the following program segment. Construct a test set that is adequate with respect to LCSAJ coverage criterion.

```
1  int GCD(int a, int b)
2  {
3     while(a != b)
4     {
5         if(a > b)
6             a = a - b;
7         else
8             b = b - a;
9      }
10
11     return a;
12 }
```