

# COMP.SE.200 Software testing Examination 20.12.2023

No material or calculators are allowed. The maximum points of each question are in parentheses; the maximum 18 points. Prof. Hannu-Matti Järvinen will assess the examination.

Please start each question at the top of a page.

## 1. Define the following terms. 2-4 sentences per term.

- a) Black box testing (1p)
- b) Flaky test(1p)
- c) Fuzz testing (1p)
- d) Negative testing (1p)
- e) Oracle (in testing) (1p)
- f) Testing pyramid

## 2. Coverage meters (6p)

Consider the following function that computes the roots of  $ax^2+bx+c=0$ . It returns false, if there is no real results or a is 0, and true, if there are roots. The root values are returned in parameters r1 and r2.

```
bool roots (double a, b, c, &r1, &r2)
{
    double det = b*b-4*a*c;
    if (det < 0 or a == 0) return false; // Both sides of "or" are always evaluated in this example
    r1 = sqrt(-b + det) / (2*a);
    r2 = sqrt(-b - det) / (2*a);
    return true;
}
```

You are now testing the above function. For each coverage below, explain the coverage very briefly and tell how many test cases are needed in order to achieve that coverage. Give a set of such test cases for each coverage.

- a) Statement coverage. (1,5p)
- b) Decision/branch coverage. (1,5p)
- c) Condition coverage. (1,5p)
- d) Multiple condition coverage. (1,5p)

## 3. Test Driven Development (6p)

Describe how test driven development works. What are its benefits and drawbacks? How does it affect the code quality if compared to other development methods?