5   Software and Security Engineering (RJA)

(a) Although the following code compiles and executes without error, give four
     reasons why it is a poor test.

```
@Test
public void testIt() {
  long time = System.currentTimeMillis();
  double r = solve(40229321L);
  if (r < 1000.0) {
    assertThat(r == 430.6).isTrue();
  }
  long elapsed = System.currentTimeMillis() - time;
  assertThat(elapsed).isLessThan(3000);
}
```

[8 marks]

(b) You are running a project to develop the next version of an operating system that
     supports mandatory access control and limits the covert-channel bandwidth that
     a process at security level High can use to signal down to a process at security
     level Low.

     Discuss the relative contribution of unit testing, integration testing and
     regression testing in checking that the covert-channel bandwidth is still
     acceptably low.   [8 marks]

(c) The operating system is now going to be used in a different environment so that
     the load pattern will change. How might this affect covert-channel bandwidth?
                                                                       [4 marks]