1. Suppose that you have constructed a test for every path through a program, and the program is correct on the tests. Does that mean the program is correct on all inputs?

Even if you test every branch and the program works, it could still be incorrect because it could work for some test that goes down some branch but not on other tests that follow that branch. As a simple example, consider a program that does a simple computation such as adding \( x \) and \( y \) together. Suppose it simply returns the value 5. This program will work for \( x = 2 \) and \( y = 3 \) but not for all kinds of other inputs such as \( x = 1 \) and \( y = 2 \). The first set of values will cover every branch, but the program is not correct. For this example, we can even make a stronger statement: the tests (i.e. \( x = 2, \ y = 3 \)) in the test set, and every \textit{path} in the program is tested on at least one test, but the program is still incorrect.