Unit testing of the logout function

The objective of the logout function is to check if the ShoppingCart is empty or not and then depending on that return True or False. In case the cart is not empty the user gets the option to clear the cart (and return True) or stay logged in (return False).

The polygon(nodes) function takes as input a ShoppingCart. Thus out of only objects of type ShoppingCart are invalid types.

We now turn to the valid inputs. The input domain can be divided into seven equivalence classes (EC):

1) EC1: Cart contains no items
2) EC2: Cart contains 1+ items, user wants to keep cart and not logout
3) EC3: Cart contains 1+ items, user wants to clear cart and logout

The coverage criteria we will use are:
For each EC, we need to test at least one input.

This leads to the following test requirements:
R1. If input is in EC1, Function returned True; Cart.items = 0;
R2. If input is in EC2, Function returned False; Cart.items != 0;
R3. If input is in EC3, Function returned True; Cart.items = 0;

These lead to the corresponding test cases:
TC1. Input= ShoppingCart without any products
TC2. Input= ShoppingCart with Product(name="Apple", price=5, units=10); UserInput: “n”;
TC3. Input= ShoppingCart with Product(name="Apple", price=5, units=10); UserInput: “No”;
TC4. Input= ShoppingCart with Product(name="Apple", price=5, units=10), Product(name="Banana", price=10, units=2); UserInput: “n”;
TC5. Input= ShoppingCart with Product(name="Apple", price=5, units=10), Product(name="Banana", price=10, units=2), Product(name="Orange", price=12, units=5); UserInput: “n”;
TC6. Input= ShoppingCart with Product(name="Apple", price=5, units=10); UserInput: “y”;
TC7. Input= ShoppingCart with Product(name="Apple", price=5, units=10); UserInput: “Yes”;
TC8. Input= ShoppingCart with Product(name="Apple", price=5, units=10), Product(name="Banana", price=10, units=2); UserInput: “y”;
TC9. Input= ShoppingCart with Product(name="Apple", price=5, units=10), Product(name="Banana", price=10, units=2), Product(name="Orange", price=12, units=5); UserInput: “y”;

In order to be able to execute the test cases, the fixtures cart_empty, cart_with_one_element and cart_with_two_elements were written.