1. What is the relationship between def statements and lambda expressions ?

**Ans. Lambda expressions are used to create anonymous functions or functions without name and** **def statement is used to define normal function with its name and parentheses.**

2. What is the benefit of lambda?

**Ans. Lamda is a convenient way for declaring small anonymous functions and they can be used** **whenever function objects are required.**

3. Compare and contrast map, filter, and reduce.

***Ans.* If you already have a list of values and you want to do the exact same operation on each of the elements in the array and return the same amount of items in the list, in these type of situations it is better to use the map method.**

**If you already have list of values but you only want to have items in the array that match certain criteria, in these type of situations it is better to use the filter method**

**If you already have list of values, but you want to use the values in that list to create something completely new, in these type of situations it is better to use the reduce method.**

4. What are function annotations, and how are they used?

**Ans. Function annotation is the standard way to access the metadata with the arguments and the return value of the function and they are used to type check the functions by declaring the type of the parameters and the return value for the functions.**

5. What are recursive functions, and how are they used?

**Ans. Recursion is a technique used to solve problems by creating a function that calls itself until your program achieves the desired result. Every recursive program must have a base case to make sure that the function will terminate at some point, otherwise the function will call itself indefinitely.**

6. What are some general design guidelines for coding functions?

**Ans**. **Safe: It can be used without causing harm.**

**Secure: It can’t be hacked.**

**Reliable: It functions as it should, every time.**

**Testable: It can be tested at the code level.**

**Maintainable: It can be maintained, even as your codebase grows.**

**Portable: It works the same in every environment.**