Question 1: Which of the following is a true statement regarding Abstraction? An abstraction barrier allows us to use something without needing to know how it is built.

Question 2: What is $11_{16} - 11_{10}$? $11_{16} = 1\times16 + 1\times1 = 17_{10}, \quad 11_{2} = 1\times2 + 1\times1 = 3_{10}, \quad$ so $17_{10} - 3_{10} = 14_{10}$.

Question 3: What does Mystery report, if B is a non-negative integer (i.e., 0, 1, 2, …)?

1 gets added to A exactly B times, so $A + 1 + 1 + \ldots + 1$ (B times) = $A + 1 \times B = A + B$

Question 4: What is your guess as to the Domain and Range of Foo?

The expression doesn't cause an error. not returns a Boolean so the domain of Foo is Booleans. letter(1) of ( ) takes a sentence (which is a superset of words which is a superset of numbers) so the range is numbers, words and sentences.

Question 5: If the output from Test is true, which can you say for sure? The second report (i.e., the value of B) is ignored since the initial if A either returns false or true. So if it returned true, A must be false.

Question 6: Which of the following are the same as the original Test block? The block is effectively "not A" since Test returns true when A is false and false when A is true. Only not(A) or false is the same as not(A).

Question 7: This script is intended to exchange the values of the variables a and b using the temporary variable temp. Which of the following can be used to replace missing code so the script works as intended? (select ONE)

Question 8: If we were given three functions:

$F(x) = x^2$

$G(x) = x - 7$

$H(x) = x + 5$

…and you wanted to calculate:

$(x - 7)^2 + 5$

…how would you compose the three functions to get that? $H(F(G(x)))$, since "x-7" happens first, then squared, then x+5.

Question 9: We want to compute the following cascade of map with mapping function M() and keep with predicate P(), but someone "glues" the map and keep together in the wrong order! Let's try to change the inputs to map and keep to make it work. Which works, which can potentially cause a domain/range error, and which doesn't cause an error but is probably a wrong answer? Imagine if DATA were "a list of lists of numbers (i.e., a 2D table of numbers)". M(x) is "item(1) of x" and P(x) is "x < 5". So the original code was meant to grab the first column of a table (i.e., first number from each inner list) and keep all the numbers from that column less than 5. It doesn't make sense to ask if a list is less than 5. Note that three of the options below have P() directly looking at a list, and in this example list < 5 is a Domain and Range (i.e., D&R) error.

D&R error because P is being run on DATA directly

This works!

D&R error because P is being run on DATA directly

D&R error because P is being run on DATA directly