Multiple Choice

Problem 1

What is the fundamental question of computer science?

Solution
B.) What can be computed?
Computer science is larger than just computers and programming. Computer science is a very large field that explores how information can be stored and manipulated in advantageous ways.

Problem 2

An algorithm is like a

Solution
D.) An algorithm is like a recipe.
Recipes consist of ingredients and instructions. The instructions take the ingredients and combine them step-by-step in a way to create something new. An algorithm does the same thing, it is a foolproof step-by-step process to accomplish some goal.

Problem 3

A problem is intractable when

Solution
D.) It is not practical to solve
Intractable problems are problems that are solvable but require too many resources or too much time to be of use. Imagine you’re going to collect every grain of sand on earth. You know how to do it and the process is possible but you and everyone else will die before you ever finish. That is an intractable problem.

Problem 4

Which of the following is not an example of secondary memory?

Solution
A.) RAM
RAM can also be known as main memory. It is the fast internal memory that changes quickly and loses information when you turn the computer off. Secondary memory sources such as hard drives and flash drives maintain their information even without power.

Problem 5

Computer languages designed to be used and understood by humans are
Solution
B.) High Level Languages
High level languages use English words and common mathematical symbols so that they are easy to read and manipulate by humans. Python is an example of a high level language.

Problem 6
A statement is

Solution
B.) A Complete Computer Command
s A statement is a small bit of code that has all of the necessary information to complete. For example, 1 + 1 would be considered a statement in English. 1 + would not be considered a statement because it would just result in everyone asking 1 plus what?

Problem 7
One difference between a compiler and an interpreter is

Solution
C.) A compiler is no longer needed after a program is translated.
Compilers create an entirely new file when they translate a program, this file is run directly by the computer and the compiler is no longer needed. An interpreter runs directly from the source code file every time the program is executed.

Problem 8
By convention, the statements of a program are often placed in a function called

Solution
B.) main
Many programming languages use this style where the program begins executing within a section of code titled main.

Problem 9
Which of the following is not true of comments?

Solution
A.) They make a program more efficient
Comments are completely ignored by the python interpreter. This does not make them unimportant. Comments are incredibly useful for explaining code in a way that will be understood by other human beings or by yourself after an absence from the code.
Problem 10

The items listed in the parentheses of a function definition are called

Solution
D.) Parameters

The variables or units of information provided to a function inside of the parentheses are called parameters.
Programming Exercises

Problem 1

Solution
a. Hello World!
b. Hello World!
c. 3
d. 3.0
e. 5
f. 5.0
g. 23
h. 2 + 3 = 5
i. 6
j. 8
k. 0.666666666666

Problem 2

Solution
The chaos program should output seemingly random numbers between 0 and 1.

Problem 3

Solution
The modified program prints a series of numbers that converges toward 0.5 at the end of the series.

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Problem 4

Solution
Note the changed '20' in the for loop.

```python
def main():
    print("This program illustrates a chaotic function")
    x = eval(input("Enter a number between 0 and 1: "))
    for i in range(20):
        x = 3.9 * x * (1 - x)
        print(x)

main()
```

Problem 5

Solution
The two major changes here are inserting the code snippet they provided and modifying the for loop to use it. The provided line asks the user for another number. The statement then stores the user's answer in the variable called 'n.' Then in the for loop instead of making it run a fixed number of iterations, we just tell it to run 'n' iterations, where n is the number that the user entered above.

```python
def main():
    print("This program illustrates a chaotic function")
    n = eval(input("How many numbers should I print: "))
    x = eval(input("Enter a number between 0 and 1: "))
    for i in range(n):
        x = 3.9 * x * (1 - x)
        print(x)

main()
```