Sample Questions

Q1. Match each definition with the correct term from the list below. Write the correct term on the blank line with each definition. Terms are used only once. Not all terms have a definition provided.

Terms

~~*programming language*~~	imperative knowledge	Turing machine
declarative knowledge	operating system	main memory
computer program	assembler	flowchart
interpreter	algorithm	compiler
CPU	token	software
bus	files	variable

Ex. An artificial language designed to express computations that can be performed by a machine, particularly a computer. *programming language*

(a) Statements of fact. _____

(b) Set of instructions for a computer to follow. _____

(c) A location in main memory where a value is stored. _____

(d) Collections of parallel wires that carry address, data, and control signals. _____

(e) A computer program transforms source code written in a programming language into another computer language. _____

(f) A type of diagram that represents an algorithm. _____

(g) A layer of software interposed between the application program and the hardware. _____

(h) A step-by-step procedure to solve a problem. _____

Q2. Perform the conversions/computations below and fill in the blanks:

a) Hex: ABCD = Decimal: _____
b) Binary: 10101010 = Hex: _____

Q3. For each code fragment given in the following table, write the output of the code fragment when it is executed. If the code would cause an error, instead write ERROR and briefly explain why an error occurs.

Code fragment	**Output or Cause of Error**
`message = BBM 101'` `print(message[4])`	
`print(4 * 4 / 2 ** 2 + 4)`	
`print(10 > 10 - '2' or True)`	

`size = 25`
`if size >= 10:`
`  print('middle')`
`elif size >= 20:`
`  print('big')`
`else:`
`  print('small')`	

Q4. What is the value of `j` after each of the following code fragments are executed?

Code fragment	**Value of `j`**
`for j in range(10):` `  j = j + j`	

`j=2`
`for i in range(1, 3, 10):`
`  j += i`	

`j=2`
`for i in range(20, 1, -4):`
`  j += i`	

`j=1`
`for i in range(j, 10):`
`  j += i`	

Q5. Consider the following two function definitions. What is the output when the code fragment is executed?

```
def first(value):
    total = 0
    if value < 5:
        total = total + 6
    elif value > 10:
        total = total + 12
    else:
        total = total + 3
    return total

def second(value):
    total = 0
    if value < 5:
        total = total + 6
    if value > 10:
        total = total + 12
    else:
        total = total + 3
    return total

print(first(12))
print(second(12))
print(first(3))
print(second(4))
```

Q6. Considering the following definitions.

```
def alpha(x, y):
    return x + beta(y, x)
def beta(x, y):
    return y – x   # [1]
```

Evaluate the following expressions:

a) What does `alpha(2, 3)` evaluate to?

b) How does the answer change if the line marked `[1]` is changed to `return x – y`?

Q7. Consider the following definition.

```
def fun(n, m):
    return m – n
```

Evaluate the following expressions:

a) `fun(fun(1, 2), 3)`

b) `fun(fun(1, 2), fun(3, fun(fun(4, fun(5, 6)), 7)))`

c) `fun(fun(1, 2), fun(3, fun(fun(4, fun(5, 6)), fun(7, 8))))`

Q8. What is the output of the following code fragment?

```
i = 3
while i != 0:
    print(i)
    i -= 1
    j = i
    while j != 0:
        print(j)
        j -= 1
    else:
        print("else inner while")
else:
    print("else outer while")
```