CS1010X Midterm Test - Answer Sheets

Student No: | | | | | | | | | |

Question 1: Warm up - Fill in the blank [1 marks]

Our (Python) computer program consists of 3 main constructs: sequential statements, _____ and _____ statements.

Question 2: Python Expressions [9 marks]

A. [2 marks]

Answer 2A:

B. [1 marks]

Answer 2B:

C. [2 marks]

Answer 2C:

D. [2 marks]

Answer 2D: (please align your output pattern nicely in a grid to avoid penalty)

E. [2 marks]

Answer 2E:

Question 3: Iteration & Recursion, with Time & Space [10 marks]

A. What is the output value of `A(50)`? [1 marks]

B. Time and space complexity of `A(n)`. [3 marks]

Time:

Space:

Justification (for time and for space): (continue to next page)

Continue 3B.

C. Please write legibly with proper indentation of your program to avoid penalty or misunderstanding of your codes. [3 marks]

```
def A_itr ( n ):
```

D. Time and space complexity of `A_tuple`. [3 marks]

Time:

Space:

Justification (for time and for space):

Question 4: Higher Order Functions [12 marks]

A. `prefix_sum(t)` [2 marks]

`<T1>:` [1 marks]

`<T2>:` [1 marks]

B. `interleave(t1, t2)` [2 marks]

`<T3>:` [1 marks]

`<T4>:` [1 marks]

C. `average(t1, t2, t3)` [2 marks]

`<T5>:` [1 marks]

`<T6>:` [1 marks]

D. `transpose(M)` [2 marks]

`<T7>:` [1 marks]

`<T8>:` [1 marks]

E. Fill in at most two out of the three boxes for this part. [2 marks]

`prefix_sum(t)` with n being the length of `t`.

Time:

Space:

Justification (for time and for space):

`interleave(t1, t2)` with n being the same length of `t1` and `t2`.

Time:

Space:

Justification (for time and for space):

`average(t1, t2, t3)` with n being the same length of `t1, t2` and `t3`.

Time:

Space:

Justification (for time and for space):

F. `transpose(M)` [2 marks]

`transpose(M)` where `M` has n rows and m columns. That is, `M` is a tuple of n tuples where each such tuple has m elements.

Time:

Space:

Justification (for time and for space):

— END OF PAPER —