

Name: _____

Student Number: _____ Section: _____

Instructions. Answer the following questions in the space provided for each item. Take note of proper format and syntax. Each item is worth two (2) points unless specified. You may use the back of your paper for scratchwork. (20 pts)

1. Convert the following to Scheme expressions, no need to compute for the total (follow the PEMDAS rule and left associativity).

(a) $(4 + 13) * 1 + 4 - (4 / 2)$

(b) $2 * 86 / 2 - 4 * 2 + 7 / 3$

2. Answer the questions for each given definition. Write your answers on the cell provided for each number. (10pts)

(a) `(define z (list 'a 'b (list 'c 'd)))`

- i. (1 point) What would be the resulting list after evaluating `z`?

- ii. (2 points) Draw the linked list representation of `z`.

- iii. (1 point) Give the command to display `c`.

(b) `(define z (list 'a 'b (list 'c (list 'd 'e) 'f (cons 'g 'h))))`

- i. (1 point) What would be the resulting list after evaluating `z`?

- ii. (2 points) Draw the linked list representation of **z**.

- iii. (2 points) Give the command to display **c**.

3. Write the sequence of **car** and **cdr** function calls that will pick the symbol **CS124** from the following lists. Assume that the name of the list is **subjects**.

- (a) (2 points) ; (**cs127** (**cs131** **cs130**) ((**cs141** (**cs123** **cs100**)) **cs124**))

- (b) (2 points) ; (**cs161** (**cs123** (**cs127** (**cs125** **cs161**) **cs124** **cs142**)))

- (c) (3 points) ; ((**cs141** **cs123** (**cs128** (()) . **cs124**)) **cs165**) **cs22** **cs21**)