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Student Number: ___2020-00761___   Section: ___T3L___

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) $(4 + 10 * 2) * 1 + 4 - (4 \,/\, 2)$

   (- (+ (* (+ 4(* 10 2)) 1) 4)(/ 4 2))

   (b) $(2 - 3 * 4) * 6 \,/\, 2 - 4 * 2 \,/\, 3$
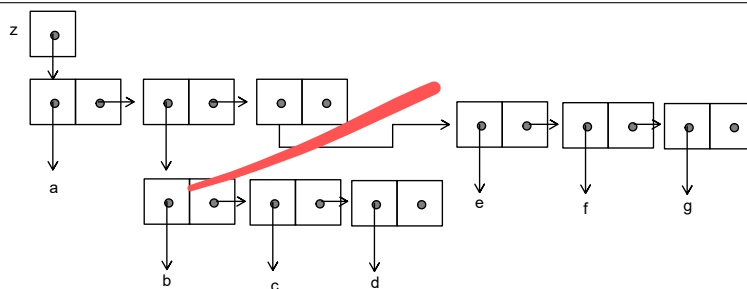
   (- (/ (* (- 2(* 3 4))6)2) (/ (* 4 2) 3))

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

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

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

      (a (b c d) (e f g))

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

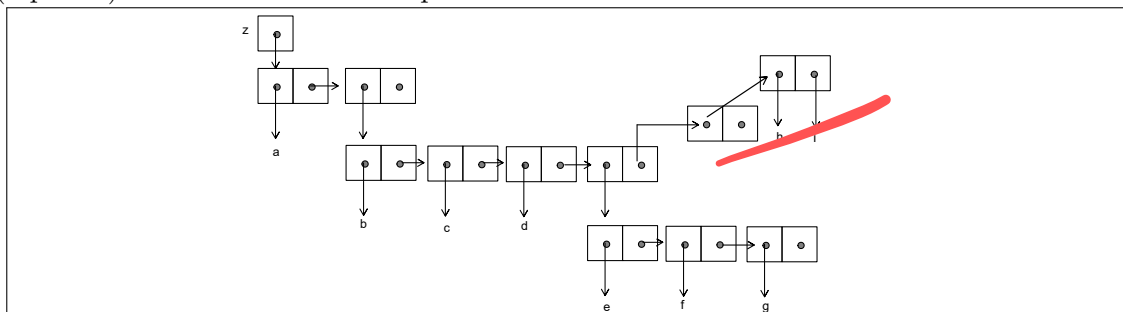   iii. (1 point) Give the command to display `c`.

      (cadr(cadr z))

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

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

      (a (b c d (e f g)(h . i)))

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

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

(cadr(cadr z)) or (car(car(car(cdr z))))

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 cs124)) cs137 cs100))`

(define subjects(list 'cs127 (list 'cs131 'cs130)(list (list 'cs141 (list 'cs123 'cs124))'cs137 'cs100)))

(cadr(cadr(caadr subjects)))

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

(define subjects(list 'cs161 (list 'cs161 (list 'cs127 (list 'cs125 'cs124) 'cs123 'cs142))))

(cadr (cadr (cadr (cadr subjects))))

    (c) (3 points) ; `((cs141 cs123 cs128 (cs23 (() .  cs124)) cs165) cs22 cs21)`

(define subjects(list (list 'cs141 'cs123 'cs128 (list 'cs23 (cons '() 'cs124)) 'cs165) 'cs22 'cs21))

(cdr(cadr(cadddr(car subjects))))