csc324 Quiz #1 Solutions Tuesday 18 January 2000

Duration: 15 minutes

Aids allowed: None

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First Name: ____________________

Student #: ____________________

Grade: ____________

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1. Each of the following expressions has a missing piece. Give the name of one Lisp function that completes the expression, making it have the value shown. Your answer should be one of `cons`, `list`, `append`, `car`, or `cdr`; or write "cannot" if none of these functions causes the expression to have the value shown.

Expression	Desired value	function name that completes the expression (or "cannot")
`(       (1 2 3) (4 5))`	`((1 2 3) (4 5))`	cannot: need quotes on the lists
`(append (       ‘(A B C D)) ‘(E F))`	`(A B E F)`	cannot: car digs out the A, but can't append to a non-list
`(append (       ‘((A B) C D) ‘(E F))`	`(C D E F)`	cdr
`(       ‘(P Q) (cdr ‘(A B C)))`	`((P Q) B C)`	cons
`(       ‘(car (X Y)) ‘(A B C))`	`(X (A B C))`	cannot: quote in the wrong place

2. Consider the following function. Note that `evenp` returns true if its argument is an even number.

```
(defun hmm (a b)
   (cond ( (eq b 0)  nil )
         ( (evenp b) (cons a (hmm a (- b 1)))  )
         ( t         (cons (list a) (hmm a (- b 1)))  )
   )
)
```

What is the value of `(hmm ‘P 3)`? `((P) P (P))`
What is the value of `(hmm 99 4)`? `(99 (99) 99 (99))`

3. State appropriate preconditions for the following function:

```
(defun silly (x y)
   (cons (car x) (cadr y))
)
```

Preconditions: x and y are lists; y has at least two elements; and the second element of y is a list.

4. Draw the Lisp tree representation for the list `((1 (3)))`.