User ID:_____ CS-3160 In-Class Quiz #5 NAME:_____

#1 During the evaluation of a function, the value of the parameter

(a) is often updated recursively as evaluate proceeds.
(b) is unbound until needed.
(c) cannot change throughout the evaluation process.
(d) may only be changed when doing so will not affect the value the function evaluates to.
(e) is statically bound to a value.

#2 A Scheme lambda function that returns the cube of its first argument less the square of its second would be

(a) (LAMBDA (x,y) (x^3 - y^2))
(b) (LAMBDA (x,y) (x * x * x - y * y))
(c) (LAMBDA (x,y) (- ((* (x x x)) (* (y y)))))
(d) (LAMBDA (x,y) (- (^ x 3) (^ y 2)))
(e) (LAMBDA (x,y) (- (* x x x) (* y y)))

#3 If a language treats functions the same way it treats data, then functions are said to be

(a) anonymous.
(b) first-class entities.
(c) atomic.
(d) higher order functions.
(e) polymorphic.

#4 One of the main reasons that functional languages have not had the success that imperative languages have enjoyed is that

(a) imperative languages are much more strongly matched to the capabilities of the underlying hardware.
(b) functional languages seem too "foreign" to most programmers.
(c) functional languages can only be applied to a very narrow range of problems.
(d) functional languages lack the features that imperative languages require.
(e) imperative languages place fewer restrictions on the programmer.

#5 Assuming n is a positive integer, what is returned by
(define (fib n) (if (= n 1) n (* n (fib (- n 1))))) ?

(a) the product of the first n even integers
(b) the sum of the first n integers
(c) double the sum of the first n integers
(d) the factorial of n
(e) the nth fibonnacci number

Enter the letter(s) of each answer below. You may choose multiple answers, but credit will be divided by the number of choices made.

1_____ 2_____ 3_____ 4_____ 5_____ 6_____ 7_____ 8_____ 9_____ 10_____

#6 Scheme language requires that _____ functions be converted to iterative implementations.

(a) tail-recursive
(b) head-recursive
(c) recursive
(d) counter-controlled looping
(e) looping

#7 The EVAL function, by itself, serves as

(a) evidence that a compiler is superfluous to functional languages.
(b) a LISP interpreter.
(c) the primary means of executing iterative algorithms.
(d) a standardizing force in the functional programming world.
(e) a means of defining anonymous functions.

#8 A function that returns a Boolean value is known as

(a) a predicate function.
(b) a relational function.
(c) a declarative function.
(d) a logical function.
(e) a Boolean function.

#9 The basic data structure in LISP/Scheme/Racket is

(a) the array
(b) the atom
(c) the string
(d) the list
(e) the cons cell

#10 What will be the result of (cons (list (cons 1 2) 3 4) 5) ?

(a) (((1 . 2) (3 4) . 5)
(b) ((1 . 2) . (3 . 4) 5)
(c) (1 2 3 4 5)
(d) (((1 . 2) 3 4) . 5)
(e) (((1 . 2) (3 . 4) . 5)