

CSE 341 — Scheme Metacircular Interpreter Discussion Questions

Suppose we have read in the following definitions into the interpreter:

```
(define (double n)
  (* 2 n))

(define (map f s)
  (if (null? s)
      '()
      (cons (f (car s)) (map f (cdr s)))))

(define (multiplyall c s)
  (map (lambda (b) (* b c)) s))
```

1. Suppose we evaluate `(double 6)`. What is the result? What is the environment used when evaluating the body of `double`?
2. Suppose we evaluate `(map double '(1 2 3))`. What is the result? What is the environment used when evaluating the body of `double`?
3. Suppose we evaluate `(map (lambda (n) (+ n 1)) '(1 2 3))`. What is the result? What is the environment used when evaluating the body of the lambda?
4. Suppose we evaluate `(multiplyall 10 '(1 2 3))`. What is the result? What is the environment used when evaluating the body of the lambda?
5. Suppose we evaluate the following expressions. What is the result? How is this converted to lambdas in the interpreter? What is the environment used when evaluating the body of the innermost `let`?

```
(define z 5)
(let ((x 10))
  (let ((x 30)
        (y x))
    (+ x y z)))
```