

## Solutions to Sample Quiz 2

### *Problem 1*

Set 1: 8  
Set 2: 12  
Set 3: (a b c bar e f)

### *Problem 2*

Ask in class to see the box and pointer diagrams.

### *Problem 3*

<1> P2  
<2> P1  
<3> GE  
<4> 3  
<5> E1  
<6> 9  
<7> E2  
<8> E2  
<9> E2  
<10> (+ a x m)  
<11> GE

### *Problem 4*

For part a, your modified code would be as follows:

```
(define (make-inc init)
  (let ((value init))
    (define (inc-val x)
      (set! value (+ value x))
      value)
      ;this line was missing on the exam
    (define (dispatch m)
      (cond ((eq? m 'inc-val) inc-val)
            ((eq? m 'reset-val) (set! value 0) value)
            (else (error "Invalid message - MAKE-INC" m))))
    dispatch))
```

For part b, your modified code would be as follows:

```
(define (make-inc init)
  (let ((value init))
    (define (inc-val x)
      (set! value (+ value x))
      value) ;this line was missing on the exam
    (define (set-val x)
      (set! value x)
      value)
    (define (dispatch m)
      (cond ((eq? m 'inc-val) inc-val)
            ((eq? m 'set-val) set-val)
            (else (error "Invalid message - MAKE-INC" m))))
    dispatch))
```

### ***Problem 5***

```
(define (map! op lst)
  (if (null? lst)
      'done
      (begin (set-car! lst (op (car lst)))
              (map! op (cdr lst)))))
```