

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 Department of Electrical Engineering and Computer Science
 6.001—Structure and Interpretation of Computer Programs
 Spring Semester, 1999

Quiz II

Sample Solutions

Question 1 (22 points):

The correct answers are:

Procedure	Environment Pointer
P1	GE
P2	E3
P3	E5
P4	E6
P5	GE
P6	E4

Frame	Enclosing Environment
E1	GE
E2	E4
E3	E5
E4	E3
E5	E6
E6	GE
GE	None

Question 2 (20 points)

Example code fragments are:

<Slot 1>

```
mine
```

<Slot 2>

```
(lambda (value)
  (set! mine value)
  'done)
```

<Slot 3> – assume slot 5 is symmetric

```
left
```

<Slot 4> – assume slot 6 is symmetric

```
(lambda (who)
  (cond ((eq? who left)
        'done)
        (else
         (set! left who)
         ((who 'set-right!) me))))
```

Question 3 (12 points):

The correct answers are:

Example	Choice
A	8
B	5
C	4
D	error

Question 4 (19 points):

The two code elements are

```
(put 'sum '(number number)
  (lambda (a b)
    (make-constant (+ a b))))
```

```
(put 'sum '(symbol number)
  (lambda (a b)
    (sum (make-constant b)
         (make-variable a))))
```

Question 5 (15 points):

Here is a correct version for the procedure.

```
(define test
  (let ((previous 'not-called-yet))
    (lambda (arg)
      (let ((hold previous))
        (set! previous arg)
        hold))))
```

Question 6 (12 points):

For the pattern

```
(?a ?b ?c)
```

and template

```
(?a * ?b * ?c)
```

matched to the expression

(1 2 3)

we get

(1 * 2 * 3)

For the rule with pattern

(~a ?b ~c)

and template

(~a * ?b * ~c)

matched to the expression

(1 2 3)

gives

(* 1 * 2 3)

(1 * 2 * 3)

(1 2 * 3 *)