Your Name: Version b Key

Section Time/Section #: _____/_____

Your TA's Name: _____

CS 221 Computer Science for Engineers Fall 2011

In-Class Quiz 2

25 October 2011 *Version b*

- Write your **Name** and **Section Number/Time** on **this page** (top-right corner).
- Write all your answers **NEATLY** on this paper. Show your work where possible.
- Answer all parts of all questions. If you need more space, use the back of the page, but **indicate that you have done so!**
- **Calculators may NOT be used.**
- You have **30 minutes.**

Problem 1. [20 points] Suppose V is the row vector `[2 5 6 1 9 7 3 5 4]`, and the variable k has the value 3. Fill in the blank with the value of each of the following MATLAB expressions:

(a) `V(1)` 2

(b) `V(2*k+1)` 3

(c) `V(k) + V(k-1)` 11

(d) `V(1:k)` [2 5 6]

(e) `V(V(k)+2)` 5 (= V(8))

Problem 2. [10 points]
Write a for-loop that does the same thing as this loop:

```
i = 1;
while i < length(vector)
     vector(i) = vector(i)^3;
end
```

i = i+1

for i = 1 : length(vector)
  vector(i) = vector(i)^3;
end

Problem 3. [10 points]
Consider the function below.

```
function x = foo(a,b,c)
  if a > b
     if a > c
        x = a;
     else
        x = c;
     end
  else  % a <= b
     if b > c
        x = b;
     else
        x = c;
     end
  end
end
```

This function computes: (circle the best answer)

(a) The conjunction of a, b and c

(b) The maximum of its three arguments

(c) The second-smallest of a, b, and c

(d) The minimum of its three arguments

(e) none of the above

Problem 4. [20 points] Suppose A is the following 2×3 matrix:

```
A =  [ 3  6  2
       1  7  2 ];
```

Now a script containing the following sequence of commands is executed:

```
sum = 0;
for i = 1:2
   for j = 1:3
      sum = sum + A(i,j);
   end
end
```

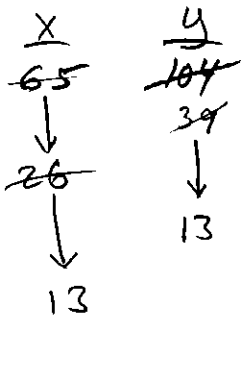
In the table below, show the value of each variable **just after** the assignment statement is executed, for **each iteration** until the script ends. "Iteration 0" refers to the values just before the loop is executed. The values for Iteration 1 (the first time the assignment statement is executed) have been filled in for you.

Iteration #	i	j	sum
0	–	–	0
1	1	1	3
2	1	2	9
3	1	3	11
4	2	1	12
5	2	2	19
6	2	3	21

Problem 5. [10 points] Consider the following script:

```
x = 65;
y = 104;
while x ~= y
   if x > y
      x = x - y;
   else
      y = y - x;
   end
end
```

What is the value of x when the script terminates?



13

Problem 6. [10 points]
Suppose that variables are assigned values as follows:

```
>> x = 163.45732;
>> z = 221.0014;
>> v = 3;
>> w = 2;
```

For each output shown, **circle** the `fprintf` statement that would produce it.

a. `>> The value of x is 163.46.`
`>>`

- `fprintf('%5.2x\n')`
- `fprintf('The value of x is %10.2f\n',x)`
- `fprintf('The value of %s is %10.2g\n',x,163.46)`
- none of the above

correct answer (because of the period) but both were accepted

b. `>> 163 2 3`
`>>`

- `fprintf('%i %i %i',x,w,v)`
- `fprintf('%d\n%d\n%d\n',163,w,v)`
- `fprintf('%10.0f %d %d\n',x,w,v)`
- none of the above

Problem 7. [20 points] Write down the value of `A` after each of the following MATLAB scripts is executed:

(a)
```
A = 1;
for i = 1:5
    A = 2*A;
end
```
value of A: 32

A = 1
1: 2
2: 4
3: 8
4: 16
5: 32

(b)
```
for i=1:4
    A(i) = i;
end
```
value of A: [1 2 3 4]

(c)
```
A = 2;
while A < 10
    A = A+3;
end
```
value of A: 11

2
5
8
11

(d)
```
A = [ 1 2 3 4 ];
for i=1:4
    A(i) = A(5-i);
end
```
value of A: [4 3 3 4]

1 2 3 4
1: 4 2 3 4
2: 4 3 3 4
3: 4 3 3 4
4: 4 3 3 4