

# EE 3054: Signals, Systems, and Transforms

## MATLAB Quiz 1 — Spring 2012

No laptop, no notes, no documentation.

Some MATLAB commands on this quiz may produce errors. For those cases, please state that.

1. Given the following array **a**,

```
a =  
    7    0    5    8  
    1    9    4    6  
    2    3    7    3
```

determine the result of each of the following commands.

```
>> a(0, 0)  
>> a(1, 3)  
>> a(:, 2)  
>> a(5)  
>> a(2, end)  
>> a([2 1], 1:3)  
>> a(end, [1 4])  
>> a(3:-1:1, 1:2:4)  
>> a(3, end:-1:1)  
>> min(a)  
>> max(a(:))  
>> b = a; b(2,:) = []; b
```

2. Given the following vector **a**,

```
a =  
    5    8    3    2    6
```

determine the result of each of the following commands.

```
>> a(1,3)  
>> a(3,1)  
>> a'  
>> a * a  
>> a .* a  
>> a.^2  
>> [a; a]  
>> [M, k] = min(a)  
>> a > 5  
>> find(a > 5)  
>> a(find(a > 5))
```

3. Sketch each graph produced by the following code fragment. Indicate the horizontal coordinates in your sketch.

```
>> n = [-2 0 2 4 6 8];  
>> x = [5 2 3 2 4 1];  
>> plot(x, 'x')  
>> plot(x)  
>> plot(n,x, 'o')  
>> plot(n,x)  
>> plot(n,x,n,x, 'o')
```

4. Write a MATLAB function called `mymin.m` that has two inputs, `x` (vector) and `a` (scalar), and one output, `b` (scalar). The output `b` should be the minimum of the elements of `x` that are greater than `a`.

For example:

```
>> mymin([1.2 4.3 0.5 8.3], 0.9)
```

```
ans =
```

```
1.2
```

because 1.2 is the minimum element of `[1.2 4.3 0.5 8.3]` that is greater than 0.9.

Your program should not use any `for` or `while` loops and it should not use any `if` statements. Your program need not do any error checking. For full credit, write the correct syntax for a MATLAB function (the full contents of the `.m` file).

5. Write MATLAB code to generate a figure like the one below of the discrete-time signal

$$x(n) = 0.8(0.9)^n \sin(0.2\pi n) u(n)$$

including axis labels, and title.

