

**Electrical Engineering and Computer Science
CSE 1560**

Sample Midterm
Wed. Mar. 30, 2014

Answer all questions in the space provided

Make sure that you have 6 pages

Student Last Name: _____

Student Given Name: _____

Student Id. No: _____

Question	Value	Score
A	40	
B	60	

Question 1. [40 points]

1. [5 points] What would the value of the following expression be if the precedence was from right to left

$1 > 2 <= 3$

if precedence was from right to left:

2 <= 3 evaluates to 1 (true)

1 > 1 evaluates to 0 (false)

if precedence was from left to right (what matlab does):

1 > 2 evaluates to 0 (false)

0 <= 3 evaluates to 1 (true)

2. [5 points] How does one get the handle to the sine function in Matlab.

`@sin`

3. [5 points] What is a primary function.

Either:

the only function in a function file callable from outside the file

Or:

The one function in the function file that has the same name as the file

4. [5 points] What is the size of arguments A, B, C in the call to mesh (A, B, C) if we want a plot with 100x100 points.

All three have size 100x100

5. [5 points] What vector represents the polynomial

$$1 + 3x + x^3$$

in Matlab

`1, 0, 3, 1`

6. [5 points] What does the function conv do?

Either:

convolution

Or:

multiplies polynomials

7. [5 points] What is the size of the vector returned by root (p) if p has size 5

4

8. [5 points] Give an example of an anonymous function.

Any of the following:

`@(x)sin(x)/x`

`@(y)y-1`

`@(y)1`

Question 2.

[60 points]

1. [10 points] What is the bug with the following Matlab code

```
function [ A ] = buggyfun(B)
```

```
%BUGGYFUN is buggy
```

```
B = inv(A)+1;
```

```
return;
```

```
end
```

A and B are switched

2. [10 points]

What is the bug with the following Matlab code

```
V = rand(1,10)
```

```
for i=1:10
```

```
    V(i) = V(i-1)^2;
```

```
end
```

When i==0 (first iteration) V(i-1) is V(0) and Matlab will report an "array out of bounds" error.

3. [20 points]

Write a simple Matlab function named `vecint` that integrates a vector. The procedure accepts one argument, a column vector V and returns another vector. Every element of the new vector is the sum of all previous elements in the original vector.

```
function [ Vo ] = vecint( Vi )
% Comments not necessary
N = length(Vi);
Vo = zeros(N,1);

Vo(1) = Vi(1);
for i=2:N
    Vo(i) = Vo(i-1)+Vi(i);
end;

end
```

4. [20 points]

Write a simple matlab procedure named `mergevec` that accepts two arguments, both of them column vectors. These Vectors are assumed sorted and not necessarily of equal size. The procedure returns another vector, with size equal to the sum of the sizes of the two original vectors. The new vector contains the elements of both original vectors sorted.

```
function [ M ] = mergevec( A, B )
```

```
Na = length(A);
Nb = length(B);
N = Na+Nb;
ia=1;
ib=1;
M = zeros(N,1);

for i=1:N
    if (ia<=Na)&(ib<=Nb);
        if A(ia)<=B(ib);
            M(i) = A(ia);
            ia = ia+1;
        else
            M(i) = B(ib);
            ib = ib+1;
        end;
    elseif ia<=Na
        M(i) = A(ia);
        ia = ia+1;
    else
        M(i) = B(ib);
        ib = ib+1;
    end;
end
```