

UNIVERSITY OF CALIFORNIA, BERKELEY
Department of Civil and Environmental Engineering

Midterm 01 – March 04, 2009

50 minutes – 50 pts

Question	Points	Grade
1	10	
2	8	
3	12	
4	8	
5	12	
Total	50	

Notes

- Write your name and your SID on the top right corner of EVERY page (including the first page)
- Full credit will be awarded only if the correct answer is given in the box provided. Partial credit may be awarded with respect to the work you show outside the boxes
- You may not leave the exam room before the exam ends
- No calculator / computer is allowed
- You may have one sheet of notes written on both sides

Your PRINTED FULL NAME + signature

Please circle your LAB Section:

11 M-W 6-8 Etcheverry	12 M-W 10-12 Etcheverry	13 M-W 2-4 Etcheverry	14 M-W 4-6 Etcheverry	15 Tu-Th 8-10 Etcheverry	16 Tu-Th 10-12 Etcheverry	17 Tu-Th 12-2 Etcheverry
18 Tu-Th 2-4 Etcheverry	19 Tu-Th 4-6 Etcheverry	20 M-W 8-10 Etcheverry	21 M-W 10-12 Wheeler	22 Tu-Th 6-8 Etcheverry	23 Tu-Th 6-8 Wheeler	24 M-W 6-8 Wheeler

Question 1

What is the output when the following commands are typed in sequence from the MATLAB command window? Do not worry about the exact format of the output.

```
>> x=2;  
>> y=x
```

```
y = 2
```

```
>> x=2;  
>> y=4*x^2/4
```

```
y = 4
```

```
>> x=2;  
>> y=(4*x)^2/4
```

```
y = 16
```

```
>> x=2;  
>> y=x*[1:4]
```

```
y = 2 4 6 8
```

```
>> x=2;  
>> y=[1:-1:-1];  
>> y=[y; y]
```

```
y = 1 0 -1  
    1 0 -1
```

Question 2

The following MATLAB commands are saved in a script file called `examQuestion2.m`. What is the output to the MATLAB command window when this script file is executed? Do not worry about the exact format of the output.

Script file `examQuestion2.m`

```
A=zeros(3); %this command establishes A as a 3x3 array of zeros.
for m=1:3
    for p=1:m
        A(m,p)=A(m,p)+m*p;
    end
end
b1=A(1,1)
b2=A(2,3)
b3=A([1,3],[1,3])
```

What is the value of A in the workspace memory?

```
A =
    1    0    0
    2    4    0
    3    6    9
```

What is the screen output when the script file `examQuestion2.m` is run?

```
b1 = 1
b2 = 0
b3 = 1 0
     3 9
```

Question 3

For each part, write the screen output in the boxes provided, and if there is an error, simply write `error` in the box. Do not worry about the exact format of the output.

(a) The function `x1.m` is defined as follows.

```
function z = x1(y)
z=y+1;
```

The following commands are then typed in the MATLAB command window:

```
>> z=5;
>> y=x1(z)
```

```
y = 6
```

(b) The function `x2.m` is defined as follows.

```
function [w,z] = x2(a)
a = 3;
w = a^2;
z=w+3;
```

The following commands are then typed in the MATLAB command window:

```
>> a=5;
>> w=3;
>> [z,w]=x2(a)
```

```
z = 9
w = 12
```

(c) The function `x3.m` is defined as follows.

```
function [w,z] = x3(y)
w = 2;
w = w~y;
z=w+1;
```

The following commands are then typed in the MATLAB command window:

```
>> y=1;
>> [w,z]=x3(y)
```

```
w = 1
z = 2
```

(d) The function `x4.m` is defined as follows.

```
function [c,d] = x4(a,b)
c = a*b;
d = a+c/b;
z = d >= c
```

The following commands are then typed in the MATLAB command window:

```
>> a=3;
>> b=4;
>> [a,b] = x4(b,a)
>> z
```

What is displayed in the command prompt after the following code is run?

```
>> a
```

```
a = 12
```

```
>> b
```

```
b = 8
```

```
>> [a,b] = x4(b,a)
>> z
```

```
z = error
```

Question 4

The following MATLAB commands are saved in a script file called `examQuestion4.m`. What is the output to the MATLAB command window when this script file is executed? Do not worry about the exact format of the output.

The MATLAB function `floor` rounds its input argument `A` to the nearest integer less than or equal to `A`: e.g. `floor(3.1415) = 3`. That is, the Matlab function `floor` rounds the input down to the nearest integer.

Script file `examQuestion4.m`

```
s=0;
k=1;
n=0.5*[2:10];
a=zeros(1,9); %this command establishes "a" as a 1x9 array of zeros

while k<=9
    if floor(n(k))==n(k)
        s=s+1;
        a(k)=s;
    end
    k=k+1;
end

k
a
```

What are the values of `k` and `a` when the script file `examQuestion4.m` is run?

```
k = 10
```

```
a =
```

```
    1    0    2    0    3    0    4    0    5
```

Question 5

Consider the following arrays defined in MatLab's workspace:

$$A = [0 \ 1 \ 0 \ 2] \quad B = \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix} \quad C = \begin{bmatrix} 4 \\ 3 \end{bmatrix}$$

What is the output when the following commands are typed in sequence from the MATLAB command window? If you believe MATLAB will output an error, write 'error'. Do not worry about the exact format of the output.

```
>> size(B*C)
     2     1
```

```
>> C*B
     error
```

```
>> A(4) + B
     7     8
     9    10
```

```
>> B(:,1) + C
     9
    10
```

```
>> A.*B(1:4)
     0     7     0    16
```

```
>> B(3:4)' + C(:,1)
    10
    11
```