

MAE 8 – Winter 2013

Final

March, 19th 2013

Instructions

Answer each question using your **iClicker**

Set the frequency code to **AB**

There will be a total of **sixteen (16) questions**

Questions are **timed**

You have **two (2) minutes** to answer **each** question

You **cannot** use a **calculator** or **computer**

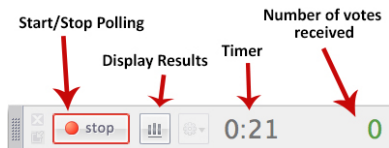
You **can** use **paper** and **pencil**

You **cannot** consult any **notes** or **books**

No communication please

Instructions

When you see:



the question is **open**: *select the best answer*

You can change your answer as many times as you want while the question is open

When you see:



the question is **closed**: *do not select answers*

Ready?

Good luck!

Question 1

After executing the following matlab commands:

```
a = [1 2 3 4; 5 6 7 8; 9 10 11 12];  
b = a([1 3 2],[2 1])
```

what is the value of the variable b?

(a)

```
b =  
    1     2  
    5     6  
    9    10
```

(b)

```
b =  
     2     1  
    10     9  
     6     5
```

(c)

```
b =  
     5     7     6  
     1     3     2
```

(d)

```
b =  
     1     2     3  
     5     6     7
```

(e)

```
b =  
     2     1  
     6     5  
    10     9
```

Question 2

After executing the following matlab commands:

```
m = [1 2 3 4; 5 6 7 8; 9 10 11 12];  
m(2,:) = -1;
```

what is the value of the variable a?

(a)

m =

1	-1	3	4
5	-1	7	8
9	-1	11	12

(b)

m =

1	2	3	4
5	-1	7	8
9	10	11	12

(c)

m =

1	2	3	4
-1	-1	-1	-1
9	10	11	12

(d)

m =

1	2	3	4
5	6	7	8
9	10	11	12

(e)

m =

1	5	9
-1	-1	-1
3	7	11
4	8	12

(f)

m =

1	-1	9
2	-1	10
3	-1	11
4	-1	12

Question 3

After executing the following matlab commands:

```
m = [5 4 -7; -10 -1 5; 2 -6 -7];  
ind = find(m > 2);  
m(ind) = 0;
```

what is the value of the variable a?

(a)

```
m =  
    5    4    0  
    0    0    5  
    2    0    0
```

(b)

```
m =  
    0    0   -7  
  -10   -1    0  
    0   -6   -7
```

(c)

```
m =  
    5    4    0  
    0    0    5  
    0    0    0
```

(d)

```
m =  
    5    4   -7  
  -10   -1    5  
    2   -6   -7
```

(e)

```
m =  
    0    0   -7  
  -10   -1    0  
    2   -6   -7
```

Question 4

The following loop

```
for i = 1 : length(v)
    if v(i) < 0
        v(i) = - v(i);
    end
end
```

can be replaced by any of the following *vectorized* instructions except:

(a) `ind = find(v < 0);
v(ind) = - v(ind);`

(c) `v = abs(v);`

(e) `v(v < 0) = - v(v < 0);`

(b) `v = -v;
v(v > 0) = -v(v > 0);`

(d) `v = -abs(-v)`

Question 5

Assume that the variable `a` contains the matrix:

```
a =  
    6    9    1    4    7  
    9    9    7    6    2
```

What is the value of `b` after you run the matlab commands:

```
>> ind = a(2,:) < a(1,:);  
>> b = a;  
>> b(1,ind) = a(2,ind);  
>> b(2,ind) = a(1,ind);
```

(a)

```
b =  
    6    9    1    4    2  
    9    9    7    6    7
```

(b)

```
b =  
    9    9    7    6    7  
    6    9    1    4    2
```

(c)

```
b =  
    9    9    7    6    2  
    6    9    1    4    7
```

(d)

```
b =  
    6    9    1    4    7  
    9    9    7    6    2
```

(e)

```
b =  
    9    9    7    6    7  
    6    9    1    4    2
```

Question 6

After executing the following matlab command:

```
>> a = char([([1; 1] * 'some_text') num2str([1; 2])])
```

what is the value of the variable a?

(a)

```
a =  
some_text  
some_text
```

(b)

```
a =  
116    101    120    116    49  
116    101    120    116    50
```

(c)

```
a =  
some_text1  
some_text2
```

(d)

```
a =  
some_text1some_text2
```

(e)

```
a =  
some_text12
```

Question 7

Which one of the following string operations will produce an error?

(a) `a = [ 'word' 'long word' ];`

(b) `a = { 'word' 'long word' };`

(c) `a = [ 'word'; 'long word' ];`

(d) `a = { 'word'; 'long word' };`

(e) `a = [ 'word'; 'long'; 'word' ];`

Question 8

After executing:

```
>> a = {1, 'abc', -1, [2 3 4]};
```

which instruction will generate an error?

(a) `a{1,2}`

(b) `a(1) + a(4)`

(c) `a{:}`

(d) `a(1,2)`

(e) `a{1} + a{4}`

Question 9

After executing:

```
>> a.x = 1;  
>> a.y = 0;  
>> a.z = -1;  
>> a(2) = struct('x',-2,'y',0,'z',2);
```

what is the result produced by the instruction

```
>> sum([a.z])
```

- (a) -2
- (b) -1
- (c) 0
- (d) 1
- (e) 2

Question 10

A file named 'file.txt' with contents

```
Date , Code , Value  
01-01-2001,5,34.5  
02-02-2002,1,2.1
```

is read by the matlab script

```
fid = fopen('file.txt');  
a = fgetl(fid);  
b = textscan(fid, '%s %d %f', 'delimiter', ',');  
fclose(fid)
```

what are the contents of b{1}?

(a) `ans =`
`Date , Code , Value`

(b) `ans =`
`'Date '`
`'01-01-2001 '`
`'02-02-2002 '`

(c) `ans =`
`5`
`1`

(d) `ans =`
`34.5000`
`2.1000`

(e) `ans =`
`'01-01-2001 '`
`'02-02-2002 '`

Question 11

After executing the script

```
fid = fopen('file.txt','w');  
i = 1; fprintf(fid,'Line %d\n', i);  
fclose(fid);  
fid = fopen('file.txt','a');  
i = i + 1; fprintf(fid,'Line %d\n', i);  
fclose(fid);  
fid = fopen('file.txt','w');  
i = i + 1; fprintf(fid,'Line %d\n', i);  
fclose(fid);
```

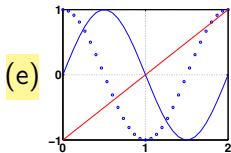
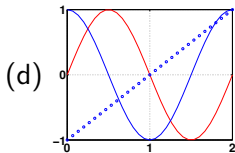
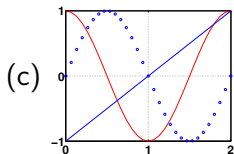
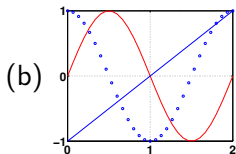
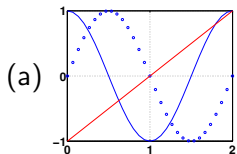
How many lines will the file 'file.txt' have?

- (a) 0
- (b) 1
- (c) 2
- (d) 3
- (e) 4

Question 12

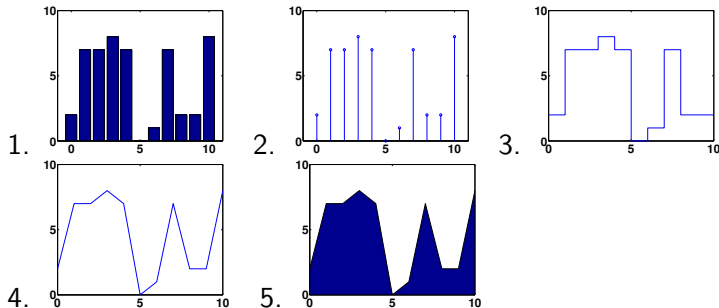
Which plot results from the following matlab script:

```
x = linspace(0,2,31);  
y = sin(pi*x);  
z = cos(pi*x);  
w = x - 1;  
plot(x, y, 'b--', x, z, 'o', x, w, 'r--')  
grid
```



Question 13

The figures:



are plots of the same data that were produced by the commands:

- (a) 1. area, 2. stem, 3. plot, 4. stairs, 5. bar
- (b) 1. area, 2. stem, 3. stairs, 4. plot, 5. bar
- (c) 1. bar, 2. stem, 3. plot, 4. stairs, 5. area
- (d) 1. bar, 2. stem, 3. stairs, 4. plot, 5. area
- (e) 1. bar, 2. plot, 3. stairs, 4. stem, 5. area

Question 14

How many input and output arguments does the function

```
function myfunction(a,b)  
% This is a function  
x = a + b
```

have?

- (a) 2 inputs, 1 output
- (b) 1 input, 0 outputs
- (c) 2 inputs, 2 outputs
- (d) 1 input, 2 outputs
- (e) 2 inputs, 0 outputs

Question 15

The function

```
function [d,e] = myfunction(a,b,c)
% This is a function
if (nargin == 2)
    c = b;
end
d = a + b + c;
e = a - b + c;
```

will not generate any errors when called by any of the following instructions except:

- (a) `a = myfunction(1,2,3)`
- (b) `[a, b] = myfunction(1,2)`
- (c) `a = myfunction(1,2,3)`
- (d) `[a, b] = myfunction(1)`
- (e) `myfunction(1,2,3)`

Question 16

What is the result of calling the recursive function

```
function y = recurse(x)
if (isempty(x))
    y = x;
else
    y = [recurse(x(2:end)) x(1)];
end
```

with the following input:

```
recurse([4 5 6 3 2])
```

(a)

ans =
4 5 6 3 2

(b)

ans =
2 3 4 5 6

(c)

ans =
2 3 6 5 4

(d)

ans =
6 5 4 3 2

(e)

ans =
4 5 6 2 3