

EXAM 1 – WRITTEN PORTION

NAME _____

SECTION NUMBER _____

CAMPUS MAILBOX NUMBER _____

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Multiple Choice	/ 50
Coding Problem	/ 50
Total	/ 100

USE MATLAB SYNTAX FOR ALL PROGRAMS AND COMMANDS YOU WRITE

Problem 1:

(4 points) Circle all of the file names that will run and not result in errors.

- a. My_first_code!.m
- b. Code_version_2.0.m
- c. Day2_3.m
- d. Good-code.m
- e. Day1 example 2.m
- f. BAD_CODE.m

Problem 2:

(4 points) Write the Matlab code for the following mathematical expression.

$$a = \sqrt{1 - \cos^2 x}$$

Problem 3:

(4 points) Given the following lines of code, where will the text be printed?

```
answer=fopen('answer.txt','wt');  
fprintf(value, 'The answer to life, the universe and everything  
is 42.\n');  
fclose(answer);
```

- a. To the command window only
- b. To a text file only
- c. To both a text file and the command window
- d. Nothing will print, because the system will give an error message

Problem 4:

(4 points) What is the value of b after the following program executes?

```
a = 1;  
b = 2;  
c = 3;  
d = a+b+c;  
b = d * b;
```

- a. b = 12
- b. b = 2
- c. b = 6
- d. other: b = _____
- e. the program crashes

Problem 5:

(4 points) You are given a matrix called A

$$A = \begin{bmatrix} 1 & 5 & 9 \\ 6 & 2 & 8 \\ 7 & 2 & 4 \end{bmatrix}$$

What will be printed to the screen by the following program? Write it as it would appear on the screen.

```
for i = 1:3  
    fprintf('%2i \n', A(3,i) )  
end
```

Problem 6:

(4 points) You are given a matrix called C:

$$C = \begin{bmatrix} 1 & 2 \\ 2 & 4 \\ 3 & 6 \\ 4 & 8 \\ 5 & 10 \end{bmatrix}$$

and a code segment:

```
[m n] = size(C)
for i = 1:m
    C(i,2) = C(i,2) + 1;
end
```

What is C after the code is executed?

a. $C = \begin{bmatrix} 2 & 3 \\ 2 & 4 \\ 3 & 6 \\ 4 & 8 \\ 5 & 10 \end{bmatrix}$

b. $C = \begin{bmatrix} 1 & 2 \\ 3 & 5 \\ 3 & 6 \\ 4 & 8 \\ 5 & 10 \end{bmatrix}$

c. $C = \begin{bmatrix} 2 & 3 \\ 3 & 5 \\ 4 & 7 \\ 5 & 9 \\ 6 & 11 \end{bmatrix}$

d. $C = \begin{bmatrix} 2 & 2 \\ 3 & 4 \\ 4 & 6 \\ 5 & 8 \\ 6 & 10 \end{bmatrix}$

e. $C = \begin{bmatrix} 1 & 3 \\ 2 & 5 \\ 3 & 7 \\ 4 & 9 \\ 5 & 11 \end{bmatrix}$

f. $C = \begin{bmatrix} 1 & 2 \\ 2 & 4 \\ 3 & 6 \\ 4 & 8 \\ 5 & 10 \end{bmatrix}$

g. Other: _____

Problem 7:

(4 points) What is the value of c after the following program executes?

```
c = 0;  
for k = 0:0.5:2  
    c = c + k;  
end
```

- a. $c = 2$
- b. $c = 2.5$
- c. $c = 3$
- d. $c = 5$
- e. other: Explain _____
- f. the program crashes

Problem 8:

(4 points) What is the value of x after executing the following code segment:

```
weight = 200;  
add = 30;  
for n = 1:4  
    weight = weight + add;  
end
```

- a. $\text{weight} = 320$
- b. $\text{weight} = 200$
- c. $\text{weight} = 230$
- d. $\text{weight} = 120$
- e. Error, program won't run
- f. Other: _____

Problem 9:

(8 points) The factorial of a positive integer n is defined by

$$\text{factorial}(n) = n! = 1 \times 2 \times 3 \times \dots \times (n-1) \times n$$

Write a short program using a for loop to compute the factorial of 20. Assign the result to a variable called Fac. You do not need to print out the answer. Just write the code required to do the computation.

Problem 10:

(10 points) Write a short program using a for loop to generate two row vectors, x and y , for plotting. The independent variable x starts from 1 and ends at 101 with an increment of 10. The dependent variable y is related to x through the following equation:

$$y = \sqrt{e^{2x} + 1}$$

You do not need to plot the figure. Just write the code required to define the two vectors.