

FALL 2018 PRACTICE EXAM

1: TRUE OR FALSE QUESTIONS

- 1. T F The **break** command is used to end a program when something bad happens
- 2. T F **If** statements and **for** loops can be used inside of a function-handler variable
- 3. T F MATLAB® will help you find syntax errors in you program, but cannot find logical (or math) errors
- 4. T F The **length** function returns the number of values in a 1D array.
- 5. T F When an **If-elseif-else** construct is used, the **else** option should include a logical condition.

2: MULTIPLE CHOICE QUESTIONS

- 1. What does the **clear** command do?
 - A. Closes all the open figure windows
 - B. Clears all the variables saved in the workspace
 - C. Clears all the output in the command window
 - D. Stops a program that is running
- 2. For a 2D array called cake, the command
`CAKE(:,1) = pi`
 - A. Change the values in CAKE that are equal to 1
 - B. Changes all the values in the 1st column to 3.14159
 - C. Changes all the values in the 1st row to 3.14159
 - D. Outputs a program error.

3. For the code

```
soda = [41 23 13 45];  
pop = abs(soda(1) - soda(4));
```

What is the value of variable pop?

- A. pop = -4
- B. pop = 14
- C. pop = 3
- D. pop = 4

4. Consider the summation

$$R = \sum_{n=1}^{\infty} \frac{1}{n^2}$$

which can be coded as shown on the right.

```
R = 0;  
n = 1;  
while 1  
    R = R+1/n^2;  
    n = n + 1;  
end
```

What is the final value of variable **result** from the code?

- A. Ummm... the loop doesn't stop. No final value.
- B. This is a p-series sum, R=1.6449.
- C. The loop doesn't start. R = 0.
- D. The loop runs one time. R = 1

5. For the code in problem 4, what commands would make the code run better?

- A. Add a **break** command if **n** gets too big.
- B. Change the **while** loop to a **for** loop, with n=1:1:100.
- C. Add a condition to the **while** loop that stops when R stops changing
- D. It runs fine. No change is needed.
- E. A, B, or C will make the code run better.

3: MATCHING

Suppose that two 1D arrays are typed into MATLAB®:

A = [1 2 3];

B = [4 5 6];

Match the operation to the correct output.

| | |
|---------------|--|
| _____ 1) A*B | a) ans = 4 10 18 |
| _____ 2) A.*B | b) Error |
| _____ 3) A./B | c) ans = 32 |
| _____ 4) A*B' | d) ans = 4 5 6 8 10 12 12 15 18 |
| _____ 5) A'*B | e) ans = 0.2500 0.4000 0.5000 |

4: 2D ARRAY COMMANDS

The following array has been entered into the MATLAB® workspace:

A =
-1 2 -1
-7 -2 8
6 -7 3

What is the output from for each command?

- 1. >> A(2,:)
- 2. >> size(A)
- 3. >> max(A)
- 4. >> max(max(A))
- 5. >> contour(A)

5: UNDERSTANDING MATLAB

In lab, you wrote a code that computes $\cos(x)$, using an infinite sum

$$\cos(x) = 1 + \sum_{n=1}^{\infty} (-1)^n \frac{x^{2n}}{(2n)!}$$

Below is a 'broken' program of the solution.

```
1 clear; close all; clc
2
3 x = input('Pick a value for x: ','s');
4 N = input('Number in series (even): ');
5
6 xpow = 1;
7 posneg = 1;
8 result = 0;
9
10 for itar = 2:2:
11     xpow = xpow*x*x
12     faq = faq*itar*(itar-1);
13     posneg = posneg*(-1);
14     result(itar) = result(itar-1)+posneg*xpow/faq;
15     break;
16 end
17
18 funCos = cosine(x);
19
20 fprintf('The approximate value is %i \n', result);
21 disp('The function value is %0.6f \n', funCos);
22 fprintf('The difference is %0.6f \n', funCos-result);
```

The code has 10 errors (GPP, syntax, or math). In the space below, identify 5 of these errors and say how to fix them. (+5 bonus if you identify all of them)

Line 3:

Line 8:

Line 10:

Line 11:

Line 12:

Line 14:

Line 15:

Line 18:

Line 20:

Line 21:

6: SMALL CODE

Using the variables below. Write a code completes the following:

- ☐ sums the value of each element of **book** into **total**
- ☐ uses **count** to determine the number of positive values in **book**
- ☐ uses an if statement set all the negative values to 0
- ☐ shows the total at the end of the program

```
book = randi([-100 100],200,300);
```

```
[R C] = size(book);
```