

\_\_\_\_\_  
(Print last name, first name, middle initial/name)

\_\_\_\_\_  
(Student ID)

Statement of integrity: I did not, and will not, break the rules of academic integrity on this exam:

\_\_\_\_\_  
(Signature)

**Instructions:**

- Read each problem *completely* before starting it!
- Do not use calculators, reference sheets, or any other material. This test is closed book.
- Solve each problem using MATLAB, except where indicated.
- Use only specified code in each problem.
- Write your solutions directly on the test using blue/black pen or pencil. Clearly indicate which problem that you are solving. You may write on the back of each sheet. If you need scrap paper, ask a proctor.
- Provide only *one* statement, expression, value, or comment per blank!
- Do *not* alter, add, or remove any code that surrounds the blanks and boxes.
- Do *not* supply multiple answers. If you do so, we will grade only one that we will choose.
- Show all work, especially algorithms. Better that you explain how you would solve a problem than to leave it blank.
- Follow good style! When possible, keep solutions general, avoid redundant code, use descriptive variables, use named constants, indent substructures, avoid breaking out of loops, and maintain other tenets of programming philosophy.
- Comment each control structure and major variable, *briefly*.
- Do not dwell on a problem if you get stuck. Do the other problems first!
- Raise your hand if have any questions.

**Points:**

- 1. \_\_\_\_\_ (20 points)
- 2a. \_\_\_\_\_ (24 points)
- 2b. \_\_\_\_\_ (25 points)
- 2c. \_\_\_\_\_ ( 1 point )
- 3. \_\_\_\_\_ (30 points)

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Subtotal: \_\_\_\_\_/(100 points)

Bonus \_\_\_\_\_ (05 points)

Total: \_\_\_\_\_/(100 points)

**Problem 1** [20 points] *Terminology, Problem-solving process, MATLAB basics*

**Ia** [1 point] Your lab instructor's name is \_\_\_\_\_ .

**Ib** [1 point] Your lecture instructor's name is \_\_\_\_\_ .

**Ic** [1 point] According to DIS, programming is \_\_\_\_\_ problem-solving.

**Id** [2 points] MATLAB stands for \_\_\_\_\_ .

**Ie** [1 point] **True** or **False**: Everything in MATLAB is an array: \_\_\_\_\_ .

**If** [1 point] **True** or **False**: The assignment statements `a=10` and `A=10` are identical: \_\_\_\_\_ .

**Ig** [2 points] Demonstrate how to remove an assigned value from the variable `x` from the command window.

**Ih** [3 points] Show one expression statement that will evaluate  $17\sqrt{2 + \frac{3}{4-1}}$ :

**Ii** [2 points] What is the output from the following statements?

```
>> x = 1; y = x + 1, z = x
```

**Ij** [2 points] What is the output from the following statement?

```
>> ~(1 ~= ~1) | 1
```

**Ik** [4 points] Write a MATLAB expression that generates a random integer between -2 and 1, inclusive.

**Problem 2** [50 points] *Algorithms*

Suppose that a user wants to simulate rolls of 6-sided dice with a program. In particular, the user wants to know how often a roll of two dice produce snake-eyes, which means that both dice roll to one.

- 2a** [24 points] Write an algorithm to design a program that will find the *percent chance* of rolling snake-eyes by determining  $(100)(\text{successful rolls})/(\text{total rolls})$ .
- 2b** [25 points] Complete the code in Problem 2b to write a program that will report the chance of rolling snake eyes. Your algorithm does not have to match this code, but it will likely be similar.
- 2c** [1 point] What is the exact value of chance of rolling snake-eyes on any given roll?
- 

**2a Algorithm:**

2b Code:

```
% Program for finding and reporting % chance of rolling snake-eyes
```

```
% Initialize variables:
```

```
maxrolls = 100; % max number of allowed rolls
```

```
count = 0; % number of rolls so far
```

```
snakeeyes = 0; % number of snake-eyes so far
```

```
% Roll both dice and count snakeeyes for maxrolls:
```

```
for count = 1:maxrolls
```

```
end
```

```
% Report chance of rolling snake-eyes
```

```
disp(['Chance of snake-eyes: ', num2str(_____), '%']);
```

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2c Answer:

**Problem 3** [30 points] *Repetition Statements*

**Problem:** Write a MATLAB program that prints out all of the even numbers between and including two numbers that a user inputs. Assume that the user inputs two legal numbers, but your program will have to determine which number is bigger than the other. Print the minimum and maximum values only if they are even. You may use logical arrays, if you wish. Be sure to supply brief comments.

**Example Session:**

```
>> problem3
Enter a number: 7
Enter another number: 2
2
4
6
```

**MATLAB Hints:** Use `mod(x,y)` to find the remainder of  $x/y$ .

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**Checklist:** Congratulations! You reached the last page of Prelim 1. Make sure that you clearly indicate your name, ID, and section. Also, re-read all of the problem descriptions/code comments/instructions. If you reached this part before exhausting the allotted time, check your test! Maybe you made a simple mistake? You should check the following:

- \_\_\_ maintained all assumptions
  - \_\_\_ remembered punctuation
  - \_\_\_ remembered **ends** for control structures
  - \_\_\_ didn't confuse *equals* with *assign* operators
  - \_\_\_ completed all tasks
  - \_\_\_ filled in ALL required blanks
  - \_\_\_ given comments when necessary
  - \_\_\_ maintained case-sensitivity
  - \_\_\_ handled "special cases" correctly
  - \_\_\_ indicated which solution to grade if it looks like you wrote multiple attempts
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**Bonus:** [5 points] You may do the following evaluation after you have finished writing and checking your prelim. We will give you extra time after the test end to complete this portion. To receive bonus points, tear this sheet off from the exam, ensure that the proctor records the points on the front page, and place it in a separate pile to maintain anonymity.

(1) What are 1 to 3 things we can do to improve lecture? (You may also say what you like, as well.)

(2) What are 1 to 3 things we can do to improve lab? (You may also say what you like, as well.)

(3) What are 1 to 3 things we can do to improve CS99, overall? (You may also say what you like, as well.)