

NOTE: You could lose five points if this page is not completed correctly!

Academic misconduct (including, but not limited to, the list below) could result in a zero on this exam, an F grade in the course, and/or other disciplinary action:

- Communication with anyone other than a proctor for ANY reason in ANY language in ANY manner.
- Sharing of ANYTHING (e.g. pencils, paper, erasers).
- Writing on paper that is not given to you by a proctor.
- Cell phones, beepers, hand-held computers, calculators, etc. in your possession during the exam.
- Failure to follow directions given by the proctor.
- Failure to stop writing when the allowed time is up (as reported by the proctor).
- Using books or other reference material.
- Disruption of the exam setting.

| | | | | | | |
|----------|----------|---|---|---|---|---|
| G | T | | | | | |
| A | A | E | | | | A |
| B | B | G | | | | B |
| C | C | 0 | 0 | 0 | 0 | C |
| D | D | 1 | 1 | 1 | 1 | D |
| E | E | 2 | 2 | 2 | 2 | E |
| F | F | 3 | 3 | 3 | 3 | F |
| G | G | 4 | 4 | 4 | 4 | G |
| H | H | 5 | 5 | 5 | 5 | H |
| I | I | 6 | 6 | 6 | 6 | I |
| J | J | 7 | 7 | 7 | 7 | J |
| K | K | 8 | 8 | 8 | 8 | K |
| L | L | 9 | 9 | 9 | 9 | L |
| M | M | | | | | M |
| N | N | | | | | N |
| O | O | | | | | O |
| P | P | | | | | P |
| Q | Q | | | | | Q |
| R | R | | | | | R |
| S | S | | | | | S |
| T | T | | | | | T |
| U | U | | | | | U |
| V | V | | | | | V |
| W | W | | | | | W |
| X | X | | | | | X |
| Y | Y | | | | | Y |
| Z | Z | | | | | Z |

← Print your GT number in the spaces provided, and shade the boxes of the corresponding numbers and letters.

By taking this exam, you signify that it is your work and that you have neither given nor received inappropriate help during the taking of this exam in compliance with the Academic Honor Code of Georgia Tech.

Name (Print): _____

Signature: _____

TA's Name: _____

| Problem | Possible Points | Earned Points | Lost Points | Grader's Name |
|--------------|-----------------|---------------|-------------|---------------|
| 1 | 10 | | | |
| 2 | 10 | | | |
| 3 | 25 | | | |
| 4 | 25 | | | |
| 5 | 30 | | | |
| | | | | |
| | | | | |
| | | | | |
| TOTAL | 100 | | | |

Problem 1 (12 Points Total)

i) `A = linspace(0, 500, 500);`

After the line above is executed, which are true? (You may select one or more answers)

-> a) `length(A)` returns 500

b) `A(2)` is less than 1

c) `A(2)` is equal to 1

-> d) `A(2)` is greater than 1 **(1.002)**

e) an error occurs

f) none of the above are true

ii) Assume that the following variables are assigned the following values:

```
A = 1;  
B = 1;  
C = 0;  
D = 0;
```

What is the result of the following?

```
(A | (B & C)) & ~D
```

a) 2

-> b) 1 true

c) 0

d) An error occurs

iii) Assume you have the following code block in a function:

```
B = eye(6,6);  
for counter = B  
    disp('Bring me my ranch dressing hose!');  
end
```

How many lines are printed when the code above is run?

a) 36

b) 12

-> c) 6

d) 1

e) an error occurs

f) none of the above are true

iv) Assume you have the following code block in a function:

```
counter = 0;  
F = 128;  
while counter < 5  
    F = F / 2;  
end
```

```
disp(F);
```

What is printed when the block above is executed?

a) 128

b) 4

c) 2

d) 0

e) an error occurs

-> f) none of the above are true **[it hangs in a loop.]**

Problem 2 (8 Points Total)

For the following, convert the given number A_{b_1} to X_{b_2} , where A_{b_1} is a number in base b_1 and X_{b_2} is the unknown number in base b_2 :

a.) $F16C_{16} = X_2$

$X = 1111000101101100$

b.) $10110111101_2 = X_8$

$X = 2675$

c.) $393_{10} = X_2$

$X = 110001001$

d.) $100101001_2 = X_{10}$

$X = 297$

Problem 3 (25 Points)

Assume the code block below is within a properly named and error free function. What is printed when the code block is run?

```
A = [1 2 3; 4 5 6; 7 8 9];
B = ones(3,3) * 2;

sizeA = size(A);

for pacific = 1:sizeA(1)
    for atlantic = 1:sizeA(2)

        arctic = A(pacific, atlantic);
        while arctic > 1
            B(pacific, atlantic) = B(pacific, atlantic) * 2;
            arctic = arctic - 1;

            if(B(pacific, atlantic) > 100)
                break;
            end
        end
    end
end

disp(B);
```

```
 2   4   8
16  32  64
128 128 128
```

Problem 4 (25 Points Total)

a)

Write a Matlab function named “identifyShape” in the space provided below. This function will take in a single argument: “sideCount”. You should return a string containing the name of the shape according to the value of “sideCount”. The values to return are listed below:

| Value of sideCount | Return string |
|--------------------|-----------------|
| Less than 3 | 'Not a shape' |
| 3 | 'Triangle' |
| 4 | 'Quadrilateral' |
| 5 | 'Pentagon' |
| Greater than 5 | 'Other' |

```
function ans = identifyShape(sideCount)
if sideCount < 3
    ans = 'Not a shape';
elseif sideCount == 3
    ans = 'Triangle';
elseif sideCount == 4
    ans = 'Quadrilateral';
elseif sideCount == 5
    ans = 'Pentagon';
else
    ans = 'Other';
end
```

b)

Write a test script for your function in part a. Your script should use a loop to test the function with the argument `sideCount` ranging from values 1 through 7.

```
for index = 1:7
    disp(identifyShape(index))
end
```

Problem 5 (30 Points)

Write a Matlab function named “rowProduct” on the following page. This function will take in one parameter: a two dimensional array named “A”. This function will calculate the product of all **even** values in a row and store that product in a one dimensional array. If a row has one even value, the product will be simply that value. If there are no even values, the product is one. After multiplying the proper values of each row and storing the result, return the one dimensional array containing the products. For example, given the array A as follows:

A =

```
    1    2    4
    3    6    9
    0    6    8
    5    7    9
```

return the following array:

ans =

```
    8    6    0    1
```

Remember that you can use the Matlab function “size” to attain the length of each dimension of the array like so:

```
>> size(A)
```

ans =

```
    4    3
```

Also recall that you can extend the contents of an array like so:

```
>> B = [1 2 3]
```

B =

```
    1    2    3
```

```
>> B = [B,4]
```

B =

```
    1    2    3    4
```

Note: You may not use any Matlab functions other than “size” to solve this problem. If you do so, you will receive no credit.

The next page has been provided for you to write your answer.

```
function r = rowProduct(A)

[rows, cols] = size(A);

for row = 1:rows
    prod = 1;
    for col = 1:cols
        n = fix(A(row,col)./2);           % should have been allowed
        if (A(row,col) - n.*2) == 0     % to use mod(A(row,col),2)
            prod = prod * A(row,col);
        end
    end
    r(row) = prod;
end
```