

EXAM 1 – WRITTEN PORTION

NAME _____

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Written Portion	/ 50
Computer Portion	/ 50
Total	/ 100

USE MATLAB SYNTAX FOR ALL PROGRAMS AND COMMANDS YOU WRITE

Problem 1: (4 points) Which of the following lines of code will not produce an error if used in MATLAB to assign the value of 10 to the given variable? Circle all options which will not produce an error.

- | | |
|----------------------|-----------------|
| a) dataPoint1 = 10; | d) M*g = 10; |
| b) 10April2014 = 10; | e) sin_x = 10; |
| c) T42v7 = 10; | f) x-data = 10; |

Problem 2: (4 points) The following code is run from the MATLAB editor:

```
clear variables

file_num = fopen('My_first_exam.txt','wt');

p = 4;

q = p/2;

fprintf('The value of q is %7.2f \n', q);

fclose(file_num);
```

The user expected the file `My_first_exam.txt` to contain the following line of text:

```
The value of q is    2.00
```

However, when the file `My_first_exam.txt` is opened the user finds it blank! Correct the code so the expected text is written to the file.

Problem 3: (4 points) What are the values of `i` and `sum_i_squared` after this program runs?

```
clear variables
clc

i = 1;
sum_i_squared = 0;

while i < 3
    sum_i_squared = sum_i_squared + i^2;
    i=i+1;
end
```

Variable	Value
i	
sum_i_squared	

Problem 4: (4 points) Which sentence will print to the Command Window if the following code is run?

```
x = 16.1724;
fprintf('The value of x is %6.3f \n', x);
```

- The value of x is 16.1724
- The value of x is 16.172
- The value of x is 16.17
- Other (explain):

Problem 5: (4 points) Circle program which will properly calculate the following summation.

$$y = \sum_{k=2}^{12} 4^k$$

a. `for k = 1:12`
 `y = y + k^4;`
`end`

d. `y = 0;`
`for k = 2:12`
 `y = y + 4^k;`
`end`

b. `y = 0;`
`for k = 2:12`
 `y = 4^k;`
`end`

e. `y = 0;`
`for k = 1:12`
 `y = y + 4^k;`
`end`

c. `y = 2;`
`for k = 2:12`
 `y = y + 4^k;`
`end`

f. Other (explain):

Problem 6: (4 points) What will the value of `fred` be after this program runs?

```
fred = 2;
for index = 2:-2:-4
    fred = fred + index;
end
```

a. `fred = -2`

b. `fred = 0`

c. `fred = 2`

d. `fred = 4`

e. other (explain):

Problem 7: (4 points) You are trying to add up all the even numbers between 2 and 100, inclusive, using the recursive assignment in the 'for' loop below:

```
for k=0:2:100
    A = A + k;
end
```

Unfortunately, you keep receiving the following error in the Command Window when you run your program:

```
Undefined function or variable 'A'.
Error in AddingAk (line 2)
    A = A + k;
```

Fix the code to correct this error. Mark your changes in the code above.

Problem 8: (4 points) What is the value of 'x' after the following program executes?

```
clear variables
x = 3;
y = 2;
z = 10;
y = x^y;
x = y/x + z - 3*x;
```

- a. $x = 3$
- b. $x = 4$
- c. $x = 5$
- d. $x = 6$
- e. Other (explain):

Problem 9: (4 points) You have been baking cupcakes, muffins, and cookies. You want to end up with more cupcakes than muffins and cookies because you really like cupcakes. So you write a program to decide if you need to bake more cupcakes:

```
clc
clear variables

cupcakes = 30;
muffins = 20;
cookies = 10;

if cupcakes > muffins > cookies
    fprintf('I baked more cupcakes than muffins and cookies. Success! \n')
else
    fprintf('Oh no! I need to bake more cupcakes! \n')
end
```

Your code prints the following line to the Command Window:

```
Oh no! I need to bake more cupcakes!
```

This result doesn't seem correct because there are obviously more cupcakes than muffins and cookies. Fix your program so that it works correctly. Mark the changes in the code above.

Problem 10: (4 points) A 2 x 3 matrix is input into Matlab with the command:

```
A = [ 1 2 3; 4 5 6];
```

You want Matlab to print the matrix as follows:

```
1.0    2.0    3.0
4.0    5.0    6.0
```

The single command which could do this (without looping) is:

- `fprintf(' %3.1f %3.1f %3.1f\n',A')`
- `fprintf(' %3.1f %3.1f %3.1f\n',A)`
- `fprintf(' %3.1f %3.1f %3.1f\n',A(1,1),A(1,2),A(1,3))`
- `fprintf(' %3.1f %3.1f\n',A(1,1), A(1,3))`
- `fprintf(' %3.1f %3.1f\n',A')`
- None of the above, looping is necessary.

Problem 11: (4 points) The matrix F , shown below, is stored in Matlab.

$F =$

1	-8	4	5
2	4	-1	0
0	-2	3	7

The following lines of Matlab are then executed which are intended to modify F .

```
for i = 1:2
    for j = 3:4
        F(i,j) = i+j;
    end
end
```

In the space below, write down the resulting F matrix after the code executes. If you think that the script will produce an error message and not modify F , write an "X".

Problem 12: (6 points) In learning about writing computer games, you decide to start simple, with the game “Rock, Paper, Scissors.” As you may recall, the winner is chosen as follows:

		A chooses		
		Rock	Paper	Scissors
B Chooses	Rock	Tie	A wins	B wins
	Paper	B wins	Tie	A wins
	Scissors	A wins	B wins	Tie

Starting with the following lines, complete the script so that the result of the game is announced in a brief message.

```
A = input('1 => Rock 2 => Paper 3 => Scissors -- A chooses: ');  
B = input('1 => Rock 2 => Paper 3 => Scissors -- B chooses: ');
```