CAD Midterm Exam 20%

Time: 30 minutes **Spring 2022**

الاسم: ..... رقم القيد: ..... المجموعة: .....

Q1. (6 Marks, 1 each) Tick V**alid** (✓) or **Not Valid** (✗) in front of the following MATLAB commands:

- `A = [2 6]; B = [4 8]; A*B` **(✗)**
- `syms x y; M = [x y^3; x*y x+y]` **(✓)**
- `H = @(x) x^3; G(2:2:8)` **(✗)**
- `a = 12; b = 3; rem(a/b)` **(✗)**
- `t = 0:10*pi; subplot(2,1,3); plot(t, sin(t))` **(✗)**
- `x = 0:10*pi; stem(sin(x), x)` **(✓)**

Q2. (**5 Marks**, **1 each**) **Evaluate** the following MATLAB codes**:**

MATLAB Expression	Evaluation Result
`>> logspace(1,3,3)`	`ans =` `10 100 1000`

`>> a = [ 1 2 3 4 ] ;`
`>> a = [a ; zeros(1,4)]`
	`a =`
	`1 2 3 4`
	`0 0 0 0`

`>> t = rand;` `>> ceil(t)`	`ans =` `1`
`>> a = [ 1 2 3 4 ] ;` `>> max(a) + min(4*a) + 2`	`ans =` `10`
`>> t = rand(2,3);` `>> size(t)`	`ans =` `2 3`

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Q3. (**5 Marks**, **1 each**) W**rite** the following Mathematical Expressions into MATLAB Expressions

Mathematical Expression	MATLAB Expression
$x = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$	`x = ones(2,3)`
$y = \begin{bmatrix} 8 & 1 & 6 \\ 3 & 5 & 7 \\ 4 & 9 & 2 \end{bmatrix}$	`y = magic(3)`
$\ln 3t^2$	`syms t` `log(3*t^2`
$\frac{d}{dx}\, x \cos\left(x + \frac{\pi}{2}\right)$	`ans =` `cos(x + pi/2) - x*sin(x + pi/2)`
$\int_{-\pi}^{\pi} x \sin(2\pi x)\, dx$	`syms x` `int(x * sin(2*pi*x) , x)`

Q4. (4 Marks) Rewrite the following MATLAB script involving a single **while** statement**:**

```
clear; clc

for m = 0:10

fprintf('2 x %d = %d\n',m ,m*2 )

end
```

```
clear; clc

m = 0;

while m <= 10

    fprintf('2 x %d = %d\n' , m, m*2)

    m = m + 1;

end
```

Best of luck

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