كلية التقنية الالكترونية
College of Electronic Technology - Tripoli

القســــم:الاتصالات/التحكم
لطلبة الفصل: الرابع

أسئلة الامتحان النهائي لمادة : التصميم باستخدام الحاسب
رمز المادة: EE231   التاريخ:2018.2.8

الفصل الدراسي: خريف 2017-2018

اسم الأستاذ:أيمن الترهوني

الزمن: ساعتان

Answer all the following questions

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Q1. (8 marks) Write a MATLAB code to solve the following expressions:

(i) $\dfrac{e^{j\theta}}{2j} + \sqrt{2}$

(ii) $sin^{-1}\left(tan\left(\dfrac{\theta}{2}\right)\right) + 270^o$

(iii) $\dfrac{E}{\sqrt{R^2 + \left(2\pi WL - \dfrac{1}{2\pi WC}\right)^2}}$

Where $\theta = \dfrac{\pi}{3}$, $E = 3$, $R = 5$, $W = 2$, $L = 4$, $C = 10$,

Q2. (8 marks) Write a MATLAB Code to solve the following system of equations:

(i) $3x - 2x^3 + 5 = 4 + x^2$

(ii) $2y = -3x - 2$
        $2x - y = -1$

Q3. (8 marks)

(i) What are the expected results of **A**, **B** and **C** when applying the given script:

(ii) What will be displaying on the screen if the Matrix **D** is entered:

1. `rand(b)`

2. `ones(4,1)`

3. `[linspace(1,3,3) ; 0:2]`

```
clear all
close all
clc

a=1; b=3; c=1.1;
A=[a ; prod([ceil(c) fix(c) floor(c)]); b ; c];
B=[rot90(A,3); reshape(A,1,4)];
C=transpose([A(3) B(end-2) B(1,2) max(A) B(2,1:3)]);

D=input('Enter a Matrix');
[E G]=size(D);
if E>G
disp('The rows are more in the Matrix')
elseif E<G
disp('The columns are more')
else
disp('This is a square Matrix')
end
```
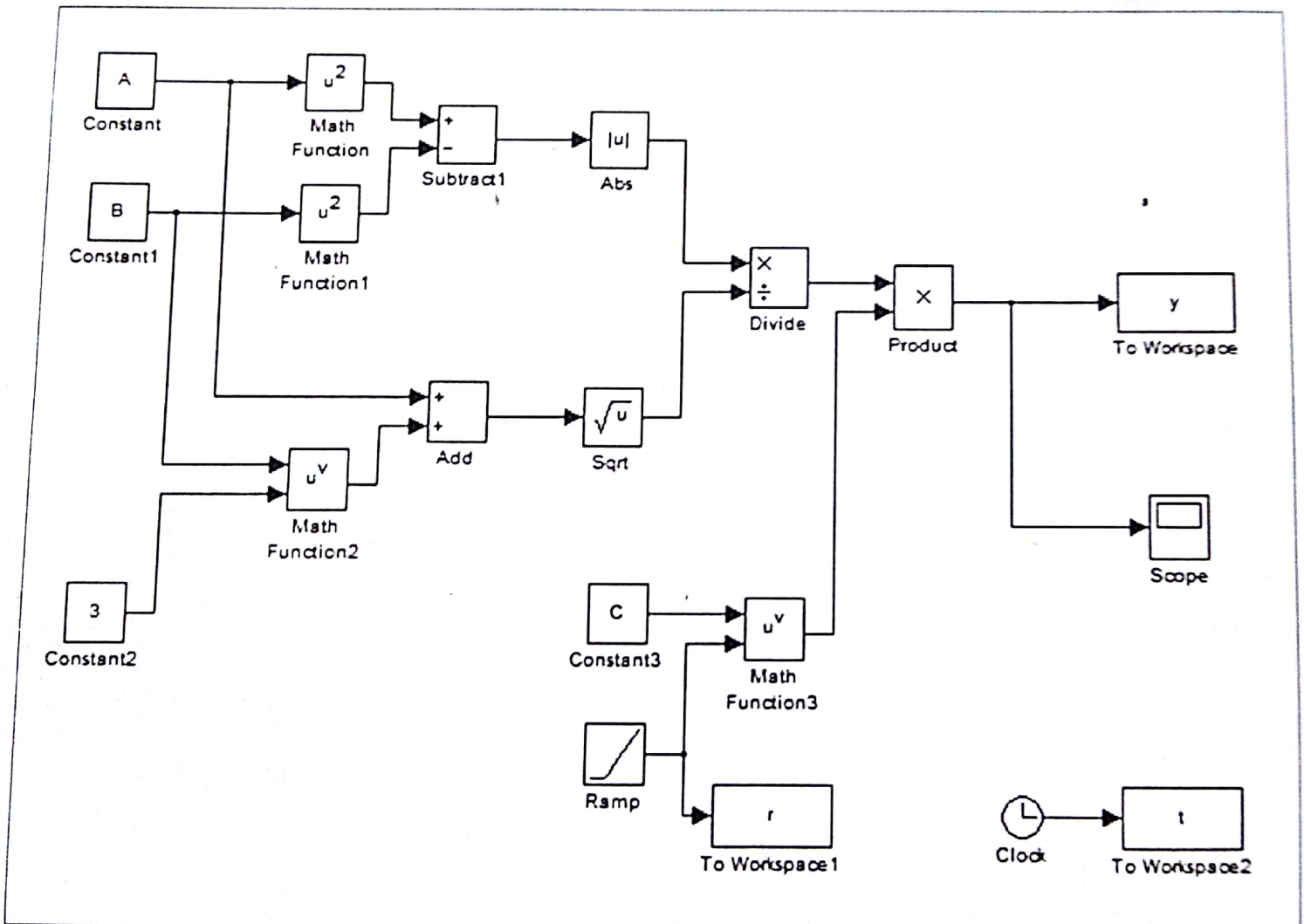
Q4. (8 marks) Write a MATLAB code to perform the following transforms:

(i) Inverse z-transform of: $\dfrac{0.5\,z}{(z-0.5)^2}$

(ii) Laplace transform of: $t + e^{at}$

Q5. (8 marks) Write a mathematical expression which represent the following Simulink model.

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أسئلة الامتحان النهائي لمادة : التصميم باستخدام الحاد رمز المادة:EE231 التاريخ: 16.7.2018 الزمن: ساعتان اسم الأستاذ:أيمن الترهوني الفصل الدراسي:ربيع 2018

Answer all the following questions

I. (8 marks) Write a MATLAB Code to:

١) Solve the following system of equations:

$$1 + 2x - x^4 = 0$$

ii) Find the Laplace transform of:

$$2\sqrt{2}u(t) + r(t) + 0.5\,e^{-at}$$

2. (8 marks) Looking to the given MATLAB code:

```
a=[0.5:0.5:1.5]; b=sum(sqrt(4)~=[1 2 3 ceil(1.1)]);
A=prod([fix(a) min([2 1 2; 1 1 1; -1 3 4])]);
B=rot90(reshape(a,3,1),b);
```
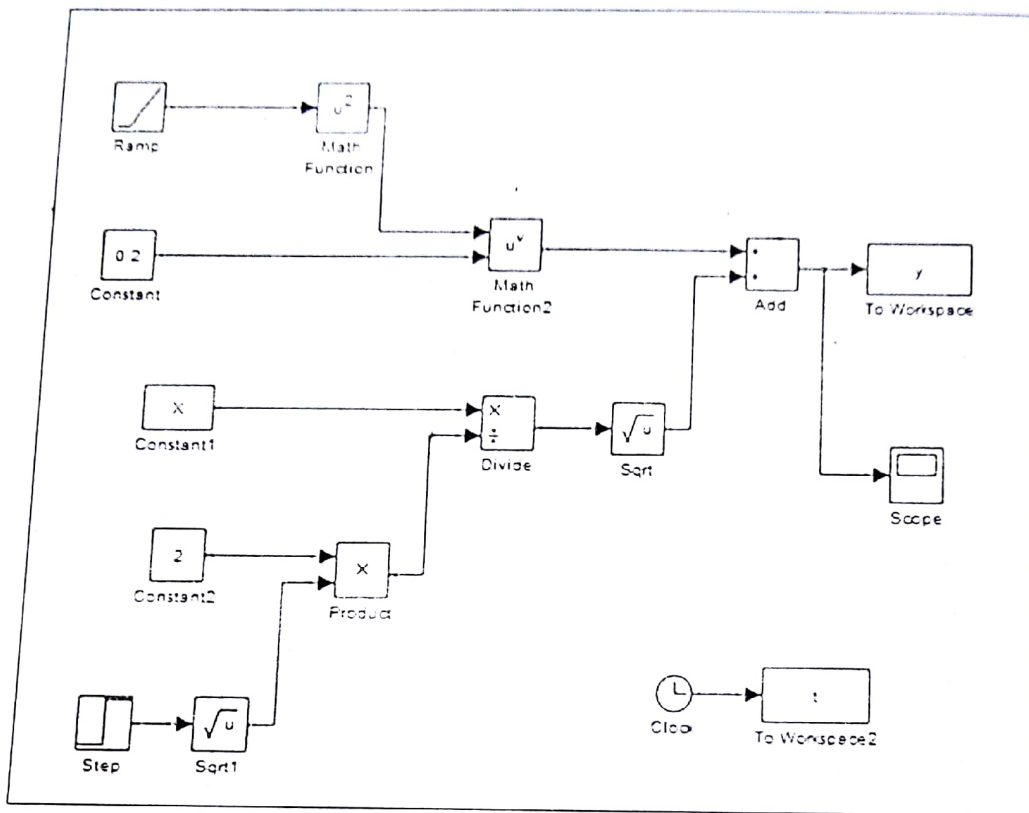
hat are the expected results of the A and B?

. (8 marks) What will be displaying on the screen for the given script if:

ref 1	ref 2	ref 3
15	35	30
10	15	40
12	58	28

```
for i=1:3
    p=input('ref 1')
    e=input ('ref 2')
    c=input('ref 3')
    if p+e>=30 && p+e<60
        R=p+e+c
        if R >=50 && R <65
            disp('P')
        elseif R >=65 && R <75
            disp('G')
        elseif R >=75 && R <85
            disp('V.G')
        elseif R >=85 && R <=100
            disp('Ex')
        elseif R <50
            disp('F')
        else
            disp('wrong input')
        end
    elseif p+e<30
        disp('N.S')
    else
        disp('wrong input')
    end
end
```

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Q4. (8 marks) Represent the following Simulink model as:

(i)   A Mathematical expression.

(ii)   A MATLAB code, where t=0, 0.2, 0.4, ... 10

Q5. (8 marks) Given the following signals:

$$X1 = \sqrt{2}\cos(0.2t)$$

$$X2 = \pi\cos(0.1\pi t)$$

$$X3 = X1 + X2$$

$$X4 = X3 \int_{1}^{2} 3y\, dy$$

Where, t = 0, 0.5, 1, 1.5, ... 100

Write a MATLAB Code to plot the signals as shown in the Figure