Department of Mathematics	Final Exam- Third Year	Time: 1 Hour
Fac. of Science, Benha Univ.	Computer Science	1 January 2014

Please answer all the following questions. Total Marks = 40 points:-

(1) [20 Marks]

a) Given the arrays

y = [1 2 3 -1 -2] , z = [-1 0 3 4 5] and A = [-1 2 0;4 -5 -1;1 -2 3].

What is the result of the following statements?

1) A(:,2)./A(:,3)	2) A(1:2:3,:)	3) g = y(end:-1:2)
4) y(5) = []	5) diag(A)	6) A.^2
7) size(A)	8) sum([z,-1,5])	9) length(z)
10) mean(y)	11) [d,n]=max(A(:))	12) [A; y(2:4)]
13) A(3,:) + [0 -2 1]	14) A-2*eye(3)	15) who
16) whos	17) all(y)	18) any(z)
19) find(y>2)	20) S = diag(y)	

(2) [20 Marks]

a) Given t = 1/30, complete the following sentences:

1) >> format short, t = ...,	2) >> format long, t = ...
3) >> format short g, t = ...,	4) >> format bank, t = ...
5) >> floor(t) = ...,	6) >> round(t) = ...
7) >> ceil(t) = ...,	8) >> fix(t) = ...

b) Write a Matlab program to compute the real roots of a quadratic equation

$$ax^2 + bx + c = 0,$$

where the roots can be determined from the formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

With My Best Wishes

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Answer Model

(1)

x = [0 -1 3 -2 -3 2] and A = [-1 2 0 -1;-2 0 -3 1;0 -1 2 3;-1 0 4 5].

```
1) A(:,2)./A(:,3)
ans =
    -Inf
     5.0000
    -0.6667

2) A(1:2:3,:)
ans =
    -1     2     0
     1    -2     3

3) g = y(end:-1:2)
g =
   -2   -1    3    2

4) y(5) = []
y =
   1   2   3   -1

5) diag(A)
ans =
     -1
     -5
      3

6) A.^2
ans =
     1       4       0
     16      25      1
     1       4       9
```

```
7) size(A)
ans =
     3     3

8) sum([z,-1,5])
ans =
     15

9) length(y)
ans =
     5

10) mean(y)
ans =
     0.6000

11) [d,n]=max(A(:))
d =
     4
n =
     2

12) [A; y(2:4)]
ans =
     -1     2     0
      4    -5    -1
      1    -2     3
      2     3    -1

13) A(3,:) + [0  -2  1]
ans =
     1   -4    4
```

```
14) A-2*eye(3)
ans =
    -3     2     0
     4    -7    -1
     1    -2     1

15) who
Your variables are:
     y   z   A

16) whos
Name      Size       Bytes        Class
 y         1x5        40          double
 z         1x5        40          double
 A         3x3        72          double

17) all(y)
ans =
     1

18) any(z)
ans =
     1

19) find(y>2)
ans =
     3

20) S = diag(z)
S =
    1     0     0     0     0
    0     2     0     0     0
    0     0     3     0     0
    0     0     0    -1     0
    0     0     0     0    -2
```

(2)

(a)

```
1) >> format short,    t = 0.0333
2) >> format long,     t = 0.033333333333333
3) >> format short g,  t = 0.03333
4) >> format bank,     t = 0.03
5) >> floor(t) = 0
6) >> round(t) = 0
7) >> ceil(t) =  1.00
8) >> fix(t)  =  0
```

(b)

```
function [r1,r2] = quadroots(a, b, c)
    if a == 0
       disp('Not quadratic equation')
    else
%quadratic formula
       d = b ^ 2 - 4 * a * c;
    end
       if d < 0
          disp('Imaginary roots')
       else
%real roots
          r1 = (-b + sqrt(d)) / (2 * a)
          r2 = (-b - sqrt(d)) / (2 * a)
       end
end
```