

الفرقة الثالثة تربية أساسي رياضيات -كلية التربية  
الفصل الدراسي الثاني 2013-2014 م  
تاريخ الامتحان: 18 / 6 / 2014

نموذج اجابة – ورقة كاملة  
المادة: مقدمة في برمجة الحاسوب  
اسم استاذ المادة: الدكتور/ عبدالحميد محمد عبدالحميد –  
جامعة بنها – كلية العلوم – قسم الرياضيات



Department of Mathematics

Final Exam-Third Year

Time: 2 Hours

Fac. of Education, Benha Univ.

Introduction to Computer Science

18 June 2014

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**Please answer all the following questions. Total Marks = 100 points:-**

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(1) Given the arrays

$x = [-2 \ 1 \ 5 \ -4 \ 2 \ 6]$ ,  $y = [0 \ -3 \ 1 \ -5 \ 2 \ 4]$  and  $A = [2 \ -1 \ 0; -1 \ 2 \ -3; 1 \ 0 \ -5]$ .

What is the result of the following statements?

- |                                 |                                       |                         |                      |
|---------------------------------|---------------------------------------|-------------------------|----------------------|
| 1) $v = y(\text{end}:-2:2)$     | 2) $x(2:4).*y(4:6)$                   | 3) $A(1:2:3,:)$         | 4) $\text{diag}(A)$  |
| 5) $b = A*y(4:6)'$              | 6) $A(:,2) = []$                      | 7) $A.^3$               | 8) $\text{size}(A)$  |
| 9) $A(2,3) = -5$                | 10) $[d,n] = \text{max}(A(:))$        | 11) $\text{min}(y)$     | 12) $\text{mean}(x)$ |
| 13) $\text{sum}([x,6])$         | 14) $C = [A(2,:); [0 \ -1 \ 2]]$      | 15) $A+2*\text{eye}(3)$ | 16) $\text{who}$     |
| 17) $\text{whos}$               | 18) $v = \text{sort}(x, 'descend')$   | 19) $\text{length}(y)$  | 20) $x \sim y$       |
| 21) $x \geq y$                  | 22) $\text{find}(y > -1)$             | 23) $\text{all}(x)$     | 24) $\text{any}(x)$  |
| 25) $z = (y > 2) \& (x \leq 1)$ | 26) $\text{xor}((x > 1), (y \leq 2))$ |                         | [52 Marks]           |

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(2) a) Write the steps and the syntax to plot the function

$$y = \sin(x), \quad 0 \leq x \leq 3\pi$$

with green-dashed line.

b) What are all values of  $n$  and  $y$  after executing the following segment code?

```
n = -5;
while (n <= 1)
    y = n + 2;
    n = n + 1;
end
```

[20 Marks]

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(3)

a) Given  $t = 50/3$ , 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) `>> rem(fix(t),5) = ....`

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

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

[28 Marks]

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With My Best Wishes  
Dr. Abdelhameed Mohamed

MODEL ANSWER

(1)

$x = [-2 \ 1 \ 5 \ -4 \ 2 \ 6]$ ,  $y = [0 \ -3 \ 1 \ -5 \ 2 \ 4]$  and  $A = [2 \ -1 \ 0; -1 \ 3 \ -3; 1 \ 0 \ -5]$ .

1)  $v = y(\text{end}:-2:2)$

$v =$

4     -5     -3

2)  $x(2:4) .* y(4:6)$

$\text{ans} =$

-5     10     -16

3)  $A(1:2:3, :)$

$\text{ans} =$

2     -1     0

1     0     -5

4)  $\text{diag}(A)$

$\text{ans} =$

2

3

-5

5)  $b = A * y(4:6)'$

$b =$

-12

-1

-25

6)  $A(:, 2) = []$

$A =$

2     0

-1     -3

```
1 -5
```

```
7) A.^3
```

```
ans =
```

```
8 -1 0
-1 27 -27
1 0 -125
```

```
8) size(A)
```

```
ans =
```

```
3 3
```

```
9) A(2,3) = -5
```

```
A =
```

```
2 -1 0
-1 3 -5
1 0 -5
```

```
10) [d,n] = max(A(:))
```

```
d =
```

```
3
```

```
n =
```

```
5
```

```
11) min(y)
```

```
ans =
```

```
-5
```

```
12) mean(x)
```

```
ans =
```

```
1.3333
```

```
13) sum([x,6])
```

```
ans =  
    14
```

```
14) C = [A(2,:);[0 -1 2]]
```

```
C =  
    -1     3    -3  
     0    -1     2
```

```
15) A+2*eye(3)
```

```
ans =  
     4    -1     0  
    -1     5    -3  
     1     0    -3
```

```
16) who
```

```
Your variables are:
```

```
    A    x    y
```

```
17) whos
```

Name	Size	Bytes	Class
A	3x3	72	double
x	1x6	48	double
y	1x6	48	double

```
18) v = sort(y,'descend')
```

```
v =  
     6     5     2     1    -2    -4
```

```
19) length(y)
```

```
ans =  
     6
```

```
20) x~=y
```

```
ans =
```

```
1 1 1 1 0 1
```

```
21) x >= y
```

```
ans =
```

```
0 1 1 1 1 1
```

```
22) find(y>-1)
```

```
ans =
```

```
1 3 5 6
```

```
23) all(x)
```

```
ans =
```

```
1
```

```
24) any(y)
```

```
ans =
```

```
1
```

```
25) z = (y>2) & (x <= 1)
```

```
z =
```

```
0 0 0 0 0 0
```

```
26) xor((x>1), (y<=2))
```

```
ans =
```

```
1 1 0 1 0 1
```

```
(2)
```

```
(a)
```

```
>> x = 0:3*pi;
```

```
>> y = sin(x);
```

```
>> plot(x,y,'g--')
```

b)

```
n = -5 ----> y = -3,  
n = -4 ----> y = -2,  
n = -3 ----> y = -1,  
n = -2 ----> y = 0,  
n = -1 ----> y = 1,  
n = 0 ----> y = 2,  
n = 1 ----> y = 3,  
n = 2 ----> stop
```

All values of n and y after executing the code are:

```
y =  
    -3    -2    -1     0     1     2     3  
n =  
    -4    -3    -2    -1     0     1     2
```

**(3)**

(a)

```
1) >> format short,    t = 16.6667  
2) >> format long,    t = 16.666666666666668  
3) >> format short g, t = 16.667  
4) >> format bank,    t = 16.67  
5) >> floor(t) = 16.00  
6) >> round(t) = 17.00  
7) >> ceil(t) = 17.00  
8) >> rem(fix(t),5) = 1.00
```

(b)

```
function [r1,r2] = quadroots(a, b, c)  
    if a == 0  
        disp('Not quadratic equation')  
    else  
%quadratic formula  
        d = b ^ 2 - 4 * a * c;
```



```
    if d < 0
        disp('Imaginary roots')
    else
%real roots
        r1 = (-b + sqrt(d)) / (2 * a)
        r2 = (-b - sqrt(d)) / (2 * a)
    end
end
```