EE 103 COMPUTATIONAL TOOLS FOR

ELECTRICAL and ELECTRONICS ENGINEERING

MIDTERM EXAM

Name Surname :

ID :

For the given programs and their function(s) below, please write the line number which need to be corrected and also write the correct forms in the box

1) We want to count the frequency of the random numbers generated between 1 and 10 using for loop, and update a graph that represents their frequencies.

```
1 clear;
2 for i=1:1000
3   x=(floor(rand(1)*10))+1;
4   array(x)=array(x)+1;
5   figure(1);
6   hold on;
7   grid on;
8   stem(array);
9   pause(1);
10 end
```

2) We want to count the frequency of the random numbers generated between 1 and 10 using while loop, and update a graph that represents their frequencies.

```
1 clear;
2 clc;
3 while i<=1000
4   x=(floor(rand(1)*10))+1;
5   array(x)=array(x)+1;
6   figure(1);
7   hold on;
8   grid on;
9   stem(array);
10  pause(1);
11 end
```

3) We want to develop a “Numeric Lotto” game by generating 6 different random numbers from 1 to 49 and display the sorted results.

```
1  clear;
2  for i =1:1:6
3  array(j)=ceil(rand(1)*49);
4  end
5  for i=1:6
6   for j=1:6
7    if (array(i)>array(i+1))
8    temp=array(i+1);
9    array(i+1)=array(i);
10   array(i)=temp;
11   end
12  end
13 end
```

4) We want to write a signum function that replaces the elemnts of a two dimensional array with ,

-1 if the value is less than 0, 1 if the value is greater than 0 , 0 if the value is =0,

```
1 function sonuc= mysignum (array)
2  for i=1:1:length(array(i))
3  for j=1:1:length(array(j))
4   if array(i,j)>0
5    array(i,j)=1;
6   else
7    if (array(i,j)=0)
8    array(i,j);
9    else
10   array(i,j)=-1
11   end
12 end
13 end
```

5) We want to sort a 2D array which is filled by random numbers from 1 & 100, and dsiplay the results on the screen only once

```
1 clear
2 clc
3 for i=1:1:10
4     for j=1:1:10
5         array(i,j)=ceil(rand(1)*99)+1;
6     end
7 end
-------------------------------------------------------
The function below is assumed to be saved in a different file...
-------------------------------------------------------
8 function array=sortarray(array)
9 for i=1:1:length(array(1,:))
10          array(i,:)=sort(array(i,:));
11 end
12 for i=1:1:length(array(:,1))
13          array(:,i)=sort(array(:,i))
14 end
-------------------------------------------------------
The function below is assumed to be saved in a different file...
-------------------------------------------------------
15 function array=mysort(array)
16 for i=1:length(array)-1
17  for j=1:length(array)
18    if array(i)>array(i+1)
19    swap(array(i,j))
20  end
21 end
22 end

-------------------------------------------------------
The function below is assumed to be saved in a different file...
-------------------------------------------------------
23 function array=swap(array,a,b)
24 temp=array(a);
25 array(a)=array(b);
26 array(b)=temp;
```

6) The function below tries to calculate the transpose of a 2D matrix

```
function array2=trans(array)
for column=1:1:length(array(i,:))
    for row=1:1:length(array(:,i))
        array(column,row)=array(row,column)
    end
end
```

7) The function below tries to store all elements into an array and add all the numbers between given “a” and “b” .

```
function res=add_all(a,b)
sum=0;
for i=max(a,b):min(a,b)
array(k)=i;k=k+1;
sum=sum+array(k);
end;
```

8) The matlab program below tries to find the value of x for any given equation

```
clc
a=input('a= :');
b=input('b= :');
c=input('c= :');
d=input('d= :');
e=input('e= :');
f=input('f= :');
found=0;
bas=-10;
son=10;
step=0.01;
while (found==0)
for x=bas:step:son
    sonuc=a*x^5+b*x^4+c*x^3+d*x^2+e*x+f;
    if sonuc>-0.01 && sonuc <0.01
        disp(' Bu fonksiyonu saglayan deger : ')
        x
        sonuc
        bas
        son
        step
        found=1;
        continue;
    end
end
if found==0
   step=step/10;
   bas=bas*2;
   son=son*2;
end
end
```

9) The function below tries to store all elements into an array and add all the numbers between given “a” and “b” and shows only the resultant value on the console.

```
1 function res=add_all(a,b)
2 sum=0;
3 for i=max(a,b):min(a,b)
4 array(k)=i;k=k+1;
5 sum=sum+array(k);
6 end;
```

10) The program below recursively calculates the total money amount by adding each elements of an array with length of 20, and displays the result on the console only once.

```
1 money=[ 1 2 3 2 4 3 2 5 4 3 2 5 6 4 2 1 2 3 5 3];
2 toplam(money)
-------------------------------------------------------
The function below is assumed to be saved in a different file...
-------------------------------------------------------
3  function sum=toplam(array)
4  if length(array)==1
5  sum=array(1);
6  else
7  last=array(length(array));
8  array=array(1:1:length(array)-1);
9  sum=last+toplam(array);
10 end
```

Question	The line number that needs correction	Corrected line
1	1	`clear;array(10)=0;`
2	2	`clc;array(10)=0;i=i+1;`
	9	`stem(array);i=i+1;`

3	3	array(j)=floor(rand(1)*49)+1;
	6	for j=1:5
4	1	function array= mysignum (array)
	7	if (array(i,j)==0)
5	17	for j=1:length(array)-1
	19	swap(array(i,j))
6	4	array2(column,row)=array(row,column)
7	1	function sum=add_all(a,b)
	3	k=1; for i=min(a,b):max(a,b)
	4	array(k)=i;k=k+1;
8		
9	3	for i=min(a,b):max(a,b)
	6	end;res=sum
10	8	array=array(1:1:length(array)-1);

EE 103 COMPUTATIONAL TOOLS FOR

ELECTRICAL and ELECTRONICS ENGINEERING

LAB EXAM

Question

Write a program that fills a one dimensional array of size 100 called “arrayone” with random numbers between 1 and 100. Then creates another two dimensional array called “arraytwo” in which the elements of the first array which are

between 0-10 are stored in the first line

between 10-20 are stored in the second line

between 20-30 are stored in the third line

.

.

between 70-80 are stored in the first line

between 80-90 are stored in the second line

between 90-100 are stored in the third line

SOLUTION

```
clear
clc
kac=100;
for i=1:1:kac
    arrayone(i)=floor(rand(1)*100)+1;
end
for j=1:1:11
    arrayindex(j)=1;
end
for i=1:1:kac

arraytwo(floor(arrayone(i)/10)+1,arrayindex(floor(arrayone(i)/10)+1))=array
one(i);
arrayindex(floor(arrayone(i)/10+1))=arrayindex(floor(arrayone(i)/10)+1)+1;
    pause(0.3)
    clc
    arrayone
    arraytwo
    arrayindex
end
```

EE 103 COMPUTATIONAL TOOLS FOR

ELECTRICAL and ELECTRONICS ENGINEERING

MIDTERM EXAM

Name Surname :

ID :

For the given programs and their function(s) below, please write the line number which need to be corrected and also write the correct forms in the box

1) We want to count the frequency of the random numbers generated between 1 and 10 using for loop, and update a graph that represents their frequencies.

```
1 clear;array(10)=0
2 for i=1:1000
3   x=(floor(rand(1)*10))+1;
4   array(x)=array(x)+1;
5   figure(1);
6   hold on;
7   grid on;
8   stem(array);
9   pause(1);
10 end
```

2) We want to count the frequency of the random numbers generated between 1 and 10 using while loop, and update a graph that represents their frequencies.

```
1 clear;
2 clc;i=1;array(10)=0;
3 while i<=1000
4   x=(floor(rand(1)*10))+1;
5   array(x)=array(x)+1;
6   figure(1);
7   hold on;
8   grid on;
9   stem(array);i=i+1;
10  pause(1);
11 end
```

3) We want to develop a “Numeric Lotto” game by generating 6 different random numbers from 1 to 49 and display the sorted results.

```
1  clear;
2  for i =1:1:6
3  array(i)=floor(rand(1)*49)+1;
4  end
5  for i=1:6
6   for j=1:6
7    if (array(i)>array(i+1))
8    temp=array(i+1);
9    array(i+1)=array(i);
10   array(i)=temp;
11   end
12  end
13 end
```

4) We want to write a signum function that replaces the elemnts of a two dimensional array with ,

-1 if the value is less than 0, 1 if the value is greater than 0 , 0 if the value is =0,

```
function sonuc= mysignum (array)
 for i=1:1:length(array(:,1))
 for j=1:1:length(array(1,:))
  if array(i,j)>0
   array(i,j)=1;
  else
   if (array(i,j)==0)
   array(i,j);
   else
   array(i,j)=-1
   end
end
end
end
```

5) We want to sort a 2D array which is filled by random numbers from 1 & 100, and dsiplay the results on the screen only once

```
clear
clc
for i=1:1:10
    for j=1:1:10
        array(i,j)=ceil(rand(1)*99)+1;
    end
end
```

The function below is assumed to be saved in a different file...

```
function array=sortarray(array)
for i=1:1:length(array(1,:))
          array(i,:)=mysort(array(i,:));
end
for i=1:1:length(array(:,1))
          array(:,i)=sort(array(:,i))
end
```

The function below is assumed to be saved in a different file...

```
function array=mysort(array)
for i=1:length(array)-1
 for j=1:length(array)-1
   if array(i)>array(i+1)
   array= swap(array, i, i+1)
   end
end
end
```

The function below is assumed to be saved in a different file...

```
function array=swap(array,a,b)
temp=array(a);
array(a)=array(b);
array(b)=temp;
```

6) The function below tries to calculate the transpose of a 2D matrix

```
function array2=trans(array)
for column=1:1:length(array(1,:))
    for row=1:1:length(array(:,1))
        array2(column,row)=array(row,column);
    end
end
```

7) The function below tries to store all elements into an array and add all the numbers between given “a” and “b” .

```
function sum=add_all(a,b)
sum=0;k=1;
for i=min(a,b):max(a,b)
array(k)=i;k=k+1;
sum=sum+array(k);
end;
```

8) The matlab program below tries to find the value of x for any given equation

```
clc
a=input('a= :');
b=input('b= :');
c=input('c= :');
d=input('d= :');
e=input('e= :');
f=input('f= :');
found=0;
bas=-10;
son=10;
step=0.01;
while (found==0)
for x=bas:step:son
    sonuc=a*x^5+b*x^4+c*x^3+d*x^2+e*x+f;
    if sonuc>-0.01 && sonuc <0.01
        disp(' Bu fonksiyonu saglayan deger : ')
        x
        sonuc
        bas
        son
        step
        found=1;
        continue;
    end
end
if found==0
   step=step/10;
   bas=bas*2;
   son=son*2;
end
end
```

9) The function below tries to store all elements into an array and add all the numbers between given “a” and “b” and shows only the resultant value on the console.

```
1 function res=add_all(a,b)
2 sum=0;
3 for i=max(a,b):min(a,b)
4 array(k)=i;k=k+1;
5 sum=sum+array(k);
6 end;
```

10) The program below recursively calculates the total money amount by adding each elements of an array with length of 20, and displays the result on the console only once.

```
1 money=[ 1 2 3 2 4 3 2 5 4 3 2 5 6 4 2 1 2 3 5 3];
2 toplam(money)
-------------------------------------------------------
The function below is assumed to be saved in a different file...
-------------------------------------------------------
3  function sum=toplam(array)
4  if length(array)==1
5  sum=array(1);
6  else
7  last=array(length(array));
8  array=array(1:1:length(array)-1);
9  sum=last+toplam(array);
10 end
```

Question	The line number that needs correction	Corrected line
1	1	`clear;array(10)=0;`
2	2	`clc;array(10)=0;i=i+1;`
	9	`stem(array);i=i+1;`

3	3	array(j)=floor(rand(1)*49)+1;
	6	for j=1:5
4	1	function array= mysignum (array)
	7	if (array(i,j)==0)
5	17	for j=1:length(array)-1
	19	swap(array(i,j))
6	4	array2(column,row)=array(row,column)
7	1	function sum=add_all(a,b)
	3	k=1; for i=min(a,b):max(a,b)
	4	array(k)=i;k=k+1;
8		
9	3	for i=min(a,b):max(a,b)
	6	end;res=sum
10	8	array=array(1:1:length(array)-1);

EE 103 COMPUTATIONAL TOOLS FOR

ELECTRICAL and ELECTRONICS ENGINEERING

LAB EXAM

Question

Write a program that fills a one dimensional array of size 100 called “arrayone” with random numbers between 1 and 100. Then creates another two dimensional array called “arraytwo” in which the elements of the first array which are

between 0-10 are stored in the first line

between 10-20 are stored in the second line

between 20-30 are stored in the third line

.

.

between 70-80 are stored in the first line

between 80-90 are stored in the second line

between 90-100 are stored in the third line

SOLUTION

```
clear
clc
kac=100;
for i=1:1:kac
    arrayone(i)=floor(rand(1)*100)+1;
end
for j=1:1:11
    arrayindex(j)=1;
end
for i=1:1:kac

arraytwo(floor(arrayone(i)/10)+1,arrayindex(floor(arrayone(i)/10)+1))=array
one(i);
arrayindex(floor(arrayone(i)/10+1))=arrayindex(floor(arrayone(i)/10)+1)+1;
    pause(0.3)
    clc
    arrayone
    arraytwo
    arrayindex
end
```

Name Surname : ID: 23. 11.2017

EE 103 Midterm Questions

For the Quetstions 1 and 2 If there are some extra comments needed, add them or if there are some errors correct them.

1. **25p** The program given below tries to create an array with size 67 and fill it with andom numbers between 13 and 78 (the random numbers may occur more than once) . Then it will eleminate the even numbers in it and reduce the size of the array to half of it where only the odd numbers will remain

```
for i=1:67
    array(i)= floor(rand(78)-13)+1;
end
for i=1:length(array)
    if mod(array(i)/2)==1
        array2(k)=array(i);
        k=k+1;
    end
end
array2
```

2. **25p** The program below tries to make a numeric lotto game in which 6 different numbers from 1 to 49 are generated and viewed in sorted form.

```
 for i=1:6
     array(i)=floor(rand(49))+1;
     while varmi(array,array(i))
     array(i)=floor(rand(49))+1;
     end
 end
 for i=1:length(array)-1
     for j=1:length(array)-1
     if array(j)>array(j+1)
         temp=array(j+1);
         array(j+1)=array(j);
         array(j)=temp;
     end
     end
 end
array
```

```
function var= varmi(array,x)
var=0;
for i=1:length(array)-1
if array(i)==x
var=1;
end
end
```

3. **20p** Write down what does the program below try to do?

```
function result=my_function(array)

result=0;

for i=2:length(array)
    for j=1:i-1
        if(array(j)==array(i))
            result =result+1;
        end
    end
end
result=length(array)-result;
```

4. **30p** Write the function that does whatever the program below does recursively.

```
a=input('a= ');
b=input('b= ');
sum=0;
for i=a:b
    sum=sum+i;
end
 sum
```

Name Surname : 11.2017

ID :

EE 103 Midterm solutions

For the Quetstions 1 and 2 . If there are some extra comments needed, add them or if there are some errors correct them.

1. **25p** The program given below tries to create an array with size 67 and fill it with andom numbers between 13 and 78 (the random numbers may occur more than once) . Then it will eleminate the even numbers in it and reduce the size of the array to half of it where only the odd numbers will remain

```
for i=1:67
    array(i)= floor(rand(1)*(78-13+1)+13;
end
 k=1
for i=1:length(array)
    if mod(array(i),2)==1
        array2(k)=array(i);
        k=k+1;
    end
end
array2
```

2. **25p** The program below tries to make a numeric lotto game in which 6 different numbers from 1 to 49 are generated and viewed in sorted form.

```
 for i=1:6
      array(i)=floor(rand(1)*49)+1;
     while(varmi(array,array(i)))
     array(i)=floor(rand(1)*49)+1
      end
 end

 for i=1:length(array)-1
     for j=1:length(array)-1
     if array(j)>array(j+1)
         temp=array(j+1);
         array(j+1)=array(j);
         array(j)=temp;
     end
     end
 end
array
```

3. **20p** Write down what does the program below try to do?

```
function result=my_function(array)
result=1;
for i=2:length(array)
    for j=1:i-1
        if(array(j)==array(i))
            result =result+1;
        end
    end
end
result=length(array)-result;
Finds the number of unique numbers
```

4. **30p** Write the function that does whatever the program below does recursively.

```
a=input('a= ');
b=input('b= ');
sum=0;
for i=a:b
    sum=sum+i;
end
 sum
```

Answer :

```
function res=myfunc(a,b)
res=topla(b)-topla(a)

function sonuc= topla(x)
if x==1
sonuc=1;
else
sonuc=x+topla(x-1);
end
```

Name Surname : **Student ID :** **28.11.2018**

EE 103 Midterm Examination
QUESTIONS

1) **40p** The program below finds all the numbers between 1000 and 9999 and keeps in an array for which sum of its digits is 15. Please find and correct If there is/are some errors on the program
Note : The lines are seperated for your possible addition, and to remove a line just strike it through.

```
clear
clc
m=1;
for i=1000:9999

~~m=1;~~

  k=1;

  num=i;

  while num>0

  digits(k)=mod(num,10);

  k=k+1;

  ~~num= (num/10);~~
  num= floor(num/10);
  end

  if sum(digits)==15

  accepted(m)=i;

  m=m+1;

  end

end

disp(accepted)
```

2) **40p** Assume a matlab program that creates an array with size of 100 and fills it by the random numbers generated between 46 and 89. Then gives it to a function called reverse which gives back the array in reversed order. Please write the function called reverse which is mentioned above…

3) **30p** Fill in the blanks for the given functions below which works correctly. *The function called myfunction takes a 2 dimensional array, then returns the*
……..
using another function called "whatt"

```
myfunction.m
-------------------------------------------------------
function ans=myfunction(array)
y=length(array(:,1));
arr=zeros(1,y);
   for i=1:y
   for j=1:length(array(1,:))
    if array(i,j)~=0
     arr(i)=arr(i)+1;
    end
   end
end
ans=whatt(arr);
whatt.m
-----------------------------------------------------
function y=whatt(s)
y=s(1);
```

Note : The lines are seperated for your possible addition, and to remove a line just strike it through.

```
clear
clc
m=1;
for i=1000:9999

 m=1;

  k=1;

  num=i;

  while num>0

  digits(k)=mod(num,10);

  k=k+1;
```

```
floor(      )
num= num/10;

end

if sum(digits)==15

accepted(m)=num; i;  13

m=m+1;

end

end

disp(accepted)
```

2) **40p** Assume a matlab program that creates an array with size of 100 and fills it by the random numbers generated between 46 and 89. Then gives it to a function called reverse which gives back the array in reversed order. Please write the function called reverse which is mentioned above…

3) **30p** Fill in the blanks for the given functions below which works correctly. *The function called myfunction takes a 2 dimensional array, then returns the* number of nonzero elements in the first ~~colomn~~ row of it. *using another function called "whatt"*

myfunction.m

```
function ans=myfunction(array)
y=length(array(:,1));
arr=zeros(1,y);
   for i=1:y
   for j=1:length(array(1,:))
    if array(i,j)~=0
     arr(i)=arr(i)+1;
    end
```

whatt.m

```
function y=whatt(s)
y=s(1);
```

EE 103 Computational Tools for Electrical - Electronics Engineering

2019 – 2020 Midterm Questions

Q1) 45 P The program below simulates 2 players playing a game in which;

The first player gives a random number between 0 and 100 and the second player tries to find it and finally the score will be the number of attempts until the second player can find that number.

if there is an error / are some errors in the program, please indicate the line number and the command that will be replaced by the content of that line.

```
1  clc
2  clear
3  x=floor(rand(1)*100)+1;
4  found=0;
5  attempt=0;
6  direction=1;
7  minn=0;
8  maxx=100;
9  while ~(found==0)
10 number=floor(rand(1)*(maxx-minn))+1;
11 attempt=attempt+1;
12 if number >x
13     direction =1;
14     minn=number;
15
16 end
17 if number <x
18     direction =0;
19     maxx=number;
20 end
21 if number == x
22     found=1;
23 end
24 end
25 fprintf('The number %d is found at %d th attempt\n',x,attempt);
```

Please write the corrected form of the required line here

```
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
```

Q2) 45 P Write a MATLAB function that finds a 2D array and returns the sum of its minimum and maximum values WITHOUT USING “min” and “max” BUILT-IN FUNCTIONS.

Q3) 10 P Write a MATLAB function that finds a 2D array and returns the sum of its minimum and maximum values BY USING “min” and “max” BUILT-IN FUNCTIONS.

EE 103 Computational Tools for Electrical - Electronics Engineering

2019 – 2020 Midterm Questions

Q1) 45 P The program below simulates 2 players playing a game in which;

The first player gives a random number between 0 and 100 and the second player tries to find it and finally the score will be the number of attempts until the second player can find that number.

if there is an error / are some errors in the program, please indicate the line number and the command that will be replaced by the content of that line.

```
1  clc
2  clear
3  x=floor(rand(1)*100)+1;
4  found=0;
5  attempt=0;
6  direction=1;
7  minn=0;
8  maxx=100;
9  while ~(found==0)
10 number=floor(rand(1)*(maxx-minn))+1;
11 attempt=attempt+1;
12 if number >x
13     direction =1;
14     minn=number;
15
16 end
17 if number <x
18     direction =0;
19     maxx=number;
20 end
21 if number == x
22     found=1;
23 end
24 end
25 fprintf('The number %d is found at %d th attempt\n',x,attempt);
```

Please write the corrected form of the required line here

```
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
```

Q2) 45 P Write a MATLAB function that finds a 2D array and returns the sum of its minimum and maximum values WITHOUT USING “min” and “max” BUILT-IN FUNCTIONS.

Q3) 10 P Write a MATLAB function that finds a 2D array and returns the sum of its minimum and maximum values BY USING “min” and “max” BUILT-IN FUNCTIONS.

16.11.2020

SOLUTIONS

EE 103 Computational Tools for Electrical - Electronics Engineering

2019 – 2020 Midterm Questions

Q1) 45 P The program below simulates 2 players playing a game in which;

The first player gives a random number between 0 and 100 and the second player tries to find it and finally the score will be the number of attempts until the second player can find that number.

if there is an error / are some errors in the program, please indicate the line number and the command that will be replaced by the content of that line.

```
1 -  clc
2 -  clear
3 -  x=floor(rand(1)*100)+1;
4 -  found=0;
5 -  attempt=0;
6 -  direction=1;
7 -  minn=0;
8 -  maxx=100;
9 -  while ~(found==0)
10 -  number=floor(rand(1)*(maxx-minn))+1;
11 -  attempt=attempt+1;
12 -  if number >x
13 -      direction =1;
14 -      minn=number;
15
16 -  end
17 -  if number <x
18 -      direction =0;
19 -      maxx=number;
20 -  end
21 -  if number == x
22 -      found=1;
23 -  end
24 -  end
25 -  fprintf('The number %d is found at %d th attempt\n',x,attempt);
```

Please write the corrected form of the required line here

```
1 -
2 -
3 -
4 -
5 -
6 -
7 -
8 -
9 -  while ~(found)
10 -  number = floor(rand(1)*(maxx-minn)) + minn;
11 -
12 -  if  number <x
13 -
14 -
15
16 -
17 -  if  number >x
18 -
19 -
20 -
21 -
22 -
23 -
24 -
25 -
```

Q2) 45 P Write a MATLAB function that finds a 2D array and returns the sum of its minimum and maximum values WITHOUT USING "min" and "max" BUILT-IN FUNCTIONS.

Q3) 10 P Write a MATLAB function that finds a 2D array and returns the sum of its minimum and maximum values BY USING "min" and "max" BUILT-IN FUNCTIONS.

1) function minplusmat = find_min_max(array)

```
minn= array(1);
maxx = array(1);
for i=1:length(array)
 if array(i) < minn
  minn = array(i);
 end
 if array(i) > maxx
  maxx = array(i);
 end
end
minplusmat = minn + maxx;
```

3) function minplusmax = find_min_max(array)

```
minplusmax = min(array) + max(array);
```

14.11.2021

EE 103

2021-2022

Midterm Exam

Q1) Please write a MATLAB program that takes a number "N" from the user, and lists the numbers from 0 to N for which the (number -1) + (number +2) is a prime number (assume that the function prime is already written using the title "function res= prime (number)" where returns 1 if the number is prime, and it returns 0 if the number is non-prime.

Q2) Please write with a sentence "What does the given program below do?"

```
k=2;
array (1) =1;
for num=2:10000
   summ=0;
   for j=1:num-1
      if mod (num, j) ==0
         summ=summ+j;
      end
   end
   if summ==num
      array(k)=num;
      k=k+1;
   end
end
disp(array)
```

Q3) The function below tries to find the root of a 5th degree equation, please find and correct the errors in this program if there is/are.

```
clc
clear
a=input ('a:');
b=input ('b:');
c=input ('c:');
d=input ('d:');
e=input ('e:');
f=input ('f:');
bas=-10;
son=10;
step=1;
found=1;
attempt=0;
while found=1
for x=bas: step: son
   count=count+1;
   if
abs(a*x^5+b*x^4+c*x^3+d*
x^2+e*x+f) ==0
      found=1;
      break;
   end
end
attempt=attempt+1;
bas=bas*2;
son=son*2;
step=step/10;
end
disp(attempt);
disp(count);
disp(x);
```

SOLUTIONS

Q1)

```
N=input(‘N : ‘);
K=1;
for i=0:N
  if prime(I)
    array(k)=I;
    k=k+1;
  end
end
disp(array);
```

Q2) It displays the list of the numbers between 2 and 10000 for which the sum of its integer dividers equals to itself(perfect number)

Q3)

```
clc
clear
a=input ('a:');
b=input ('b:');
c=input ('c:');
d=input ('d:');
e=input ('e:');
f=input ('f:');
bas=-10;
son=10;
step=1;
found=0;
attempt=0;
count=0;
while found==0
for x=bas: step: son
   count=count+1;
   if abs(a*x^5+b*x^4+c*x^3+d*x^2+e*x+f) <0.01
      found=1;
      break;
   end
end
attempt=attempt+1;
bas=bas*2;
son=son*2;
step=step/10;
end
disp(attempt);
disp(count);
disp(x);
```

Name Surname : SOLUTIONS

ID :

27.11.2023

2023-2024 Fall

Midterm Exam

EE 103 Computational Tools for Electrical and Electronics Enginering

Q1) Write a Matlab FUNCTION that TAKES AN ARRAY FROM THE CALLER and RETURNS two seperated arrays in sorted form, one of which includes the odd numbers in the taken array and other includes the even ones. *(You can directly use all the built-in functions, and the functions that are written in the lecture without rewriting them)*

Q2) Write with sentences what does the program given below do ? (line by line explaination is not desired)

```
y(1)=0;
for i=1:4
  x=floor(rand(1)*(20))+14;
  while myfunction(x,y) || mod(x,2)==1
  x=floor(rand(1)*(20))+14;
  end
  y(i)=x;
end
disp(y)

function res=myfunction(x,y)
res=0;
for i=1:length(x)
if array(i)==y
res=1;
end
```

(33)

Displays 4 different even numbers between

Q3) Please find the errors/mistakes in the program given below which tries to find the subtraction of the sum of the ODD NUMBERS in an array from the sum of the numbers stored in the EVEN INDEXES in the same array. *(2 false corrections will remove the grade that you get from 1 true correction, however, the grade of this question can not be negative)*

```
clear
for i=1:1:100
  array(i)=101-i;
end
for i=1:length(array)
  evenindexes(i)=array(2*i);
end
odds=(mod(array,2));
oddnumbers=odds*array;
disp(sum(evenindexes)-
sum(oddnumbers));
```

(11) (11) (11)

for i=1:floor(length(array)/2);

Q1)

```
function [odds, evens] = myfunction (array)
k=1
m=1
for i=1: length (array)
  if mod (array(i), 2) ==1
     odds(k) = array(i);
     k=k+1;
  else
     evens(m) = array(i);
     m=m+1;
  end
end
odds = sort (odds)
evens = sort (evens)
```

---

alternatively;

```
function [odds, evens] = myfunction (array)
evens = sort(eleminatezeros (~mod(array,2).*array)
odds = sort(eleminatezeros ( mod(array, 2).*array)
```