10-01-2019

MECE 101 Final

Name: Surname: Number: Signature:

Q1) A function is given below:

function[output1,output2,output3]=sinav\_function(a,b,k,n)

for i=1:n,

 a=k\*(a+b);

 k=b;

 b=a;

end

output1=a;

output2=b;

output3=k;

end

We call this function as:

**[output1,output2,output3]=sinav\_function(1,1,1,4)**

What is ‘output1’, ‘output2’ and ‘output3’? **(25 points).**

Q2) A function is given below:

function [count\_perfect,count]=division\_rule(n,k)

count\_perfect=0;

count=0;

number=n;

while number>1,

 division1=number/k;

 division2=floor(number/k);

 if division1==division2,

 number=division1;

 count\_perfect=count\_perfect+1;

 else

 number=division2;

 count=count+1;

 end

end

end

1. We call this function as below. What is ‘count\_perfect’ and ‘count’? **(25 points)**

**[count\_perfect,count]=division\_rule(81,3)**

1. We call this function as below. What is ‘count\_perfect’ and ‘count’? **(25 points)**

**[count\_perfect,count]=division\_rule(22,2)**

**Hint: ‘floor’ function in MATLAB rounds the input towards negative infinity**

**Ex: floor(5.0001)**$\rightarrow $ **5, floor(5)**$ \rightarrow $**5, floor(5.999999)**$ \rightarrow $**5, floor(4.999)**$ \rightarrow $**4, floor(0.0001)**$ \rightarrow $**0**

3) For the Simulink model below the inputs are a(t)=5Sin(2πf1t) where f1=0.25 Hertz, b(t)=2. There is a summation component and absolute value taking component as in the figure.



1. What is y(t)? **(10 points)**
2. Draw y(t) (for drawing use the figure with grids below). **(15 points)**

