



Inspiring Excellence

Department of Computer Science and Engineering

CSE330: Numerical Methods (Lab)

Assignment 3, Summer 2019

Total Marks: 20

-
- You must use Matlab to solve the following problems.
 - Read the questions carefully and follow the instructions.
-

Marks

1. Write a function to perform Lagrange interpolation. The function will take three arrays as input. The first two arrays will consist the values of independent variable and their corresponding dependent variable values. The third array will contain the independent variable values at which you wish to interpolate. First line of your matlab file should look like this:

5

function yy=Lagrange_int(x,y,xx)

For this problem, you can use any relevant values that you find relevant to run this function.

2. For the following circuit(check the next page) find the **voltage** and **current** passing through each resistor. Use Simulink for this problem.

5

Assume your **8 digit Student ID number** as the values of A,B,C,D,E,F,G,H respectively. For example: If your student ID is 19201023 then

$A = 1, B = 9, C = 2, D = 0, E = 1, F = 0, G = 2, H = 3$. In addition to that, $M =$ **your theory section number**

Use the resistor values as given below:

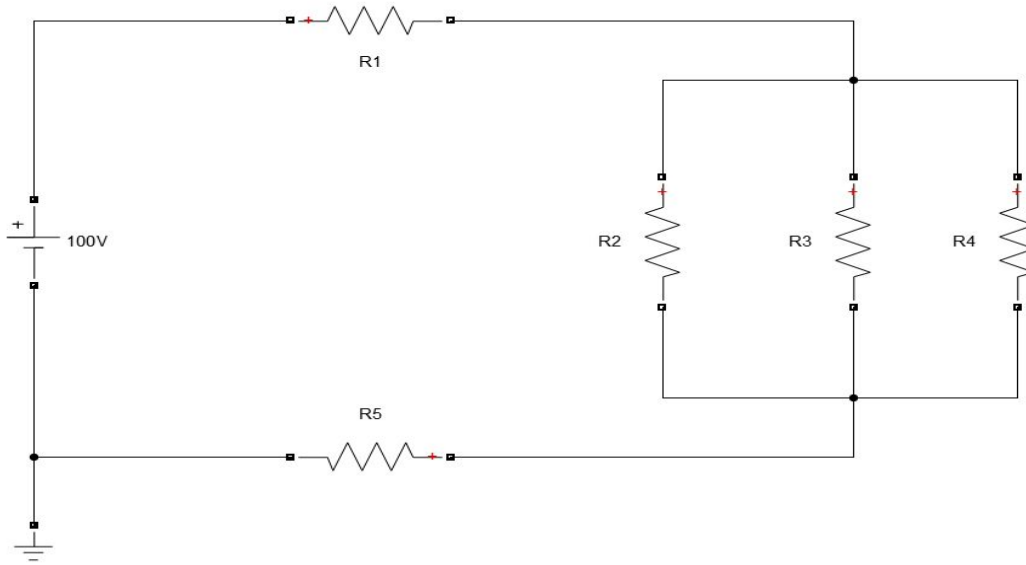
$R1 = B \text{ Ohms}$

$R2 = (GH + 2) \text{ Ohms}$

$R3 = (BD + E) \text{ Ohms}$

$R4 = (CM + GH) \text{ Ohms}$

$R5 = (A+D) \text{ KiloOhms}$



3. For the following expression

5

$$f(x) = \cos(10\pi x) + \sin(35\pi x)$$

Find $f'(2)$ with Forward difference method, Backward difference method, Central difference method. Then use Matlab built-in function to find real value and find out error (in %) for each method. You should write a function that takes the necessary inputs and returns all the results. [use $\Delta x = 0.001$ where necessary]

4. Write a Matlab function that evaluates the following using the **Trapezoidal method** and **Simpson's 1/3 rule**:

2.5x2
=5

$$I = \int_2^5 \frac{\sin(x)}{x^2 - 1} dx$$

For Trapezoidal use 30 intervals ($h = 0.1034$). [to generate the x values you can use, $x = \text{linspace}(2,5,30)$]

- The End -