Maximum exam score is 30 points.

1. (2 points) Can a meter movement and a single resistor be used to construct an **ideal** voltmeter or ammeter? Why or why not?

2. (2 points) Consider the system

   \[ y(t) = 10 \int_0^1 x(t) dt \]

   where \( x(t) \) is the system input and \( y(t) \) is the system output. Is this a linear system? Justify.

3. (1 point) Provide the complete definition of electric power.
4. (5 points) A meter movement has a series resistance of 10Ω and a full scale current of 1mA. Use this meter movement to design a 10V full scale voltmeter. Be sure to show a schematic of your design.
5. (5 points) Find node voltages $v_1$ and $v_2$ using nodal analysis.
6. (5 points) Find mesh currents $I_1$ and $I_2$ using mesh analysis.

![Circuit Diagram](image-url)
7. (5 points) Thevenize the following circuit “looking into” terminals A-B. Be sure to sketch the Thevenin equivalent circuit.
8. (5 points) Find the power of each circuit element. Be sure to show all work.