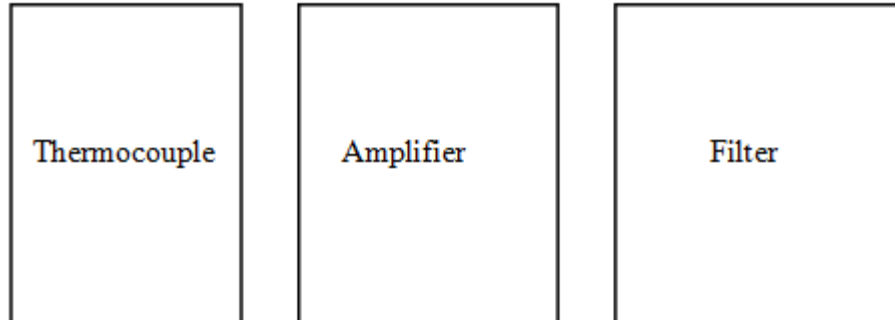


Name : _____ Number _____

The following figure shows early stages of a mechatronics system.



The signal from the sensor needs to have its voltage amplified _____ times. The output impedance of the thermocouple is _____ and the output voltage from the thermocouple is _____.

Part 1: Design an amplifier to generate an output signal that is _____ if you are given a resistor of 10 k Ω . (2 marks)

Part 2: Design an amplifier to generate an output signal _____ if you are given two resistors of 10 k Ω . (2 marks)

Part 3: Compare the two amplifiers in terms of filter is $10\text{ k}\Omega$. (2 marks)

if the input resistance of the

Part 4: A filter is needed to attenuate noise at but still let through to the next circuit. Design an active filter with an input impedance of , cutoff frequency of , and a unity gain (Gain = 1). Find the appropriate values of the components. (4 marks)