Analog Electronics **Hwk 5**a

1.-

EXERCISE

2.17 Consider the instrumentation amplifier of Fig. 2.20(b) with a common-mode input voltage of +5 V (dc) and a differential input signal of 10-mV-peak sine wave. Let $(2R_1) = 1$ kΩ, $R_2 = 0.5$ MΩ, and $R_3 = R_4 = 10$ kΩ. Find the voltage at every node in the circuit.

Ans. $v_{I1} = 5 - 0.005\sin\omega t$; $v_{I2} = 5 + 0.005\sin\omega t$; v_- (op amp A_1) $= 5 - 0.005\sin\omega t$; v_- (op amp A_2) $= 5 + 0.005\sin\omega t$; $v_{O1} = 5 - 5.005\sin\omega t$; $v_{O2} = 5 + 5.005\sin\omega t$; $v_-(A_3) = v_+(A_3) = 2.5 + 2.5025\sin\omega t$; $v_o = 10.01\sin\omega t$ (all in volts)

2.- Read Section **2.5** (from text**): Integrators and Differentiators**