Indian Institute of Technology Hyderabad

# *Electrical Engineering*
# Indian Institute of Technology Hyd
# Analog Electronics

March 9, 2024

Deadline: 23 March 2024 | *Assignment # 5* | Maximum Marks: TBD

**Instructions:**

1. Lab experiments.

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1. Design the following in LT Spice:

   a. Design a practical integrator using opamps available in the lab. Find the UGB of the opamp and based on the same design the integrator for minimum frequency of 5 kHz. Please mind that for a practical integrator, the minimum frequency of the input signal must be at least 10 times than the cut-off frequency of the system. Choose the passive components wisely to achieve the proper response. Apply a square waveform to this integrator with a time period of 100 us and demonstrate the working of the integrator.

   b. Design a practical differentiator using the same opamp for input signals with frequency ranging from DC to 10 kHz. To realized the system, keep a series resistor with the forward capacitor and keep a capacitor in parallel with feedback resistor.

      Please mind that for a practical differentiator, the maximum frequency of the input signal must be at least 10 times lesser than the cut-off frequency of the system. Choose the passive components wisely to achieve the proper response. Plot the frequency response of the differentiator. Apply a sinusoidal waveform of 1 kHz to this system and demonstrate the working of the differentiator.

   c. Use the appropriate components available in the lab and design a 5 bit R-2R ladder DAC on bread board and show the working of the same. Put a reference voltage of 2 volts.

Student's roll number: Ended here