Course: Analog Integrated Circuit
Instructor: Prof. M. El-Banna
Term: Winter

Sheet 5:
Electronics Section
Time: SAT 12:00-2:00pm

1. A particular op amp using ± 15V supplies operates linearly for outputs in the range – 13V to +13V. If used in an inverting amplifier configuration of gain –100, what is the rms value of the largest possible sinewave that can be supplied at the input without output clipping?

2. For an op amp differentiator circuit having a time constant of 1 ms, using an op amp whose linear output range is ± 11V, what is the maximum rate of rise of acceptable input signals?

3. An op amp having a slew rate of 10V/μs is to be used in the unity gain follower configuration, with input pulses that rise from 0 to 5V. What is the shortest pulse that can be used while ensuring full-amplitude output? For such a pulse, describe the output resulting.

4. Show that for an op amp having the internal structure discussed in the lecture, the relationship between the slew rate and the unity-gain frequency is given by:

$$SR = \left[\frac{I_{max}}{G_m}\right]\omega_t$$

where I_{max} is the maximum current available from the input stage and G_m is the transconductance of the input stage.