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B.E. / B.Tech (Full Time) DEGREE ARREAR EXAMINATIONS, APRIL / MAY 2012

ELECTRONICS AND COMMUNICATION ENGINEERING BRANCH

FIFTH SEMESTER (Regulations-2008)

EC 9302 – LINEAR INTEGRATED CIRCUITS

Time: 3 Hours

Max. Marks: 100

Answer ALL Questions

Part-A (10x2=20 Marks)

1. An operational amplifier has a slow rate of 35 V/ μ s. How long will it take the output to change from 0 to 15 V.
2. Draw the graph to compare the dominant and pole zero compensation technique.
3. Show the following equation using single op-amp.

$$V_0 = \int_0^t (V_1 + 5V_2 + 7V_3 + V_4) dt$$

4. Design a Wein bridge oscillator that will oscillate at 3 KHz.
5. How are multiplier classified? Draw the various classifications?
6. What is compander ICs? List few application of it?
7. An 8 bit DAC has resolutions of 25 mv / LSB. Find V_{OFS} and V_0 if the input is $(11100000)_2$.
8. Draw the various analog switches and list their usage?
9. Design a Monostable multivibrator for a pulse width of 10 ms by using IC 555.
10. Draw the low noise op-amps characteristic and give their typical ratings.

Part-B (5x16=80 Marks)

- 11.(i) Derive and discuss the transfer characteristics of differentiate amplifier. (8)
(ii) Design a Widlar current source for generating a constant current $I_0 = 10 \mu A$. Assume $V_{cc} = 10 V$, $V_{BE} = 0.7V$, $\beta = 125$. Use $V_T = 25 mv$. (8)
- 12.(a)(i) Discuss the principle of inverting Schmitt trigger with its transfer characteristics. (8)
(ii) A Schmitt trigger with $V_{UT} = 0V$, $V_H = 0.2 V$ converts a 1 KHz sine wave of amplitude 4 V_{pp} into square wave. Calculate the time duration of the negative and positive portion of the output waveform. (8)

OR

- 12.(b)(i)(a) Design on op-amp differentiator that will differentiate an input signal with $F_{max} = 100 Hz$. (4)
(b) Draw the output waveform for a sine wave of 1V peak at 100 Hz applied to the differentiator. Also generate for a square wave input. (4)
(ii) Design an instrumentation amplifier for a gain of 1000. (4)