

II B.Tech I Semester Supplementary Examinations, November 2005
LINEAR & DIGITAL IC APPLICATIONS
(Common to Computer Science & Engineering, Information Technology
and Computer Science & Systems Engineering)

Time: 3 hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) List out the ideal characteristics of an OP-AMP. [3]
(b) With neat block diagram explain the function of various building blocks of an OP-AMP. [10]
(c) Draw the equivalent circuit of an OP-AMP. [3]
2. (a) Draw the circuit diagram of a two input non inverting type summing amplifier and derive the expression for output voltage. [7]
(b) Briefly explain why negative feedback is desirable in amplifier applications [5]
(c) How does negative feedback affect the performance of an inverting amplifier? [4]
3. (a) Derive the frequency of oscillation of a RC phase shift oscillator and explain the operation of the circuit. [12]
(b) Define supply voltage sensitivity. What is meant by poorly regulated power supply? [4]
4. (a) Explain the operation of Monostable multivibrator using 555 timer. Derive the expression of time delay of a Monostable multivibrator using 555 timer. [10]
(b) Design a Monostable multivibrator using 555 timer to produce a pulse width of 100 m sec. [6]
5. (a) Draw the schematic circuit diagram of the following and explain their working. [12]
 - i. Analog phase detector
 - ii. VCODerive necessary expressions.
(b) What is their role in PLL? Explain. [4]
6. (a) Explain the operation of a delay equalizer circuit with neat sketches. Derive an expression relating input and output voltages of the equalizer. [8+2]
(b) For the all pass filter, determine the phase shift between input and output at $f=2$ kHz. To obtain a positive phase shift. What modifications are necessary in the circuit? [6]

7. For the given circuit explain its operation with the help of Truth Table. Find h_{FEmin} , Fan-out if $h_{FE}=30$, and Noise-Margin for the given circuit shown below (figure 1). (Assume all the active devices are made of silicon). [16]

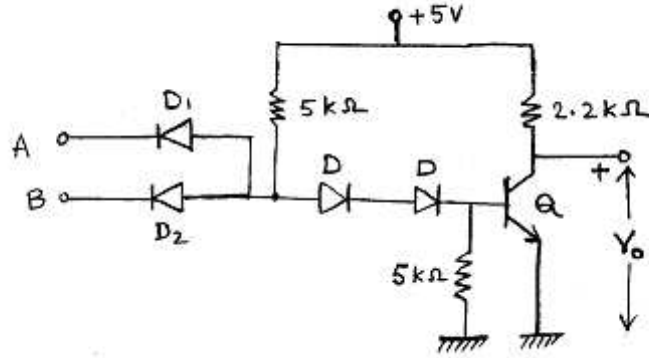


Figure 1:

8. (a) Draw the circuit of a Ladder type DAC for 4 bits and derive expression for output voltage. [8]
 (b) Sketch the Analog output voltage for the given digital code. [4]
 (c) Compare R-2R and Weight Resistor types of ADC. [4]
