

**III B.Tech I Semester Supplementary Examinations, November 2005**  
**LINEAR & DIGITAL IC APPLICATIONS**

( Common to Electronics & Communication Engineering, Electronics &  
Instrumentation Engineering, Electronics & Control Engineering,  
Mechatronics and Electronics & Telematics)

Time: 3 hours

Max Marks: 80

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. (a) What are the three differential amplifier configurations? Compare and contrast these configurations. [7]  
(b) what is a level translator circuit? Why is it used with the cascaded differential amplifier used in OP-AMPS? [5]  
(c) Explain the term ‘Slew Rate’ and how it affects the frequency response of an an OP-AMP? [4]
2. (a) Explain the differences between ac and dc amplifiers [6]  
(b) What is instrumentation amplifier? What are its features? List any three applications of instrumentation amplifier. [10]
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. Discuss, with relevant circuits and waveforms, the working of Monostable multivibrator using 555 timer. [16]
5. (a) What is the working principle of PLL? Explain. [4]  
(b) Give the block diagram of PLL and explain about each block in detail. [8]  
(c) Give any one application of PLL. [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. (a) What is meant by Tri-state logic ? Draw the circuit of Tri-state TTL logic and explain its functions. [8]  
(b) Draw the circuit of ECL logic OR/NOR gate and explain its functions. [8]
8. (a) i. Compare weighted resistor D/A converter and R-2R D/A converter.

- ii. Why successive approximation D/A converter is preferable than parallel comparator A/D converter. Explain. [8]
- (b) Draw the schematic block diagram of Dual-slope A/D converter and explain its operation. Derive expression for its output voltage  $V_o$ . [8]

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