

**III B.Tech I Semester Supplementary Examinations, November 2006**  
**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 is an OP-AMP? Why it is called so? [4]  
(b) Explain the parameters that should be considered for ac and dc applications of an OP-AMP [5]  
(c) Draw and explain the three open loop OP-AMP configurations with neat circuit diagram [7]
2. (a) Define slew rate and derive the expression for it. List causes of the slew rate and explain its significance in applications [10]  
(b) Explain the difference between slew rate and transient response [6]
3. (a) Draw the schematic diagram of Wien Bridge Oscillator and derive the expression for frequency of oscillation [10]  
(b) What are the conditions to be satisfied by a circuit to produce oscillations? [6]
4. (a) Design a 555 Astable multivibrator to operate at 10 KHz with 40% duty cycle. [8]  
(b) Explain in which the 555 timer can be used as Astable multivibrator [8]
5. (a) Draw the circuit diagram IC 1496 balanced modulator circuit and explain its operations. Sketch the output waveform for the square wave inputs with a phase difference  $\Phi$  . [8]  
(b) Draw the circuit of PLL as frequency multiplier and explain its working. [8]
6. (a) Explain the term "Frequency Sealing" with suitable example. [6]  
(b) Design a wide band-pass filter with  $f_L=200Hz$ .  $F_H=1KHz$  and a pass-band gain=4. Draw the frequency response and calculate 'Q' factor for the filter. [10]
7. (a) Draw the circuit of ECL logic OR/NOR gate and verify the Boolean expression. [8]  
(b) List out the major advantages of ECL logic. [4]  
(c) Explain the functions of a Tri-state TTL gate. [4]

8. (a) Draw the circuit of a Weighted Resistor DAC and obtain expression for n-bits. [8]  
(b) Sketch the Analog output voltage for the given digital input code. [4]  
(c) What are the major disadvantages in this type? [4]

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