

B.Tech. Degree V Semester Examination, November 2008**EC/EI 505 MICRO ELECTRONICS & INTEGRATED CIRCUITS**
(2006 Scheme)

Time: 3 Hours

Maximum Marks: 100

PART A
(Answer ALL questions)

(8 x 5 = 40)

- I
- Define the term virtual ground in an op amp. How is it different from ordinary ground.
 - Draw the circuit of a half wave rectifier using op amp and explain its working with relevant wave forms.
 - Define the term slew rate. Also derive the expression for slew rate in an op amp.
 - Design a first order LPF with a cutoff frequency of 1 KHz and pass band gain of 2.
 - Define the terms
 - lock-in-range
 - capture range
 - pull-in-time
 - How can a PLL be used as a frequency translator.
 - List 3 advantages and two applications of thick film hybrid ICs.
 - Differentiate between thick film and thin film hybrid ICs.

PART B

(15 x 4 = 60)

- II For a voltage series feed back amplifier, calculate the closed loop gain, input resistance with feed back, output resistance with feedback and bandwidth with feedback. (15)
- OR**
- III a) Define the following op amp characteristics. (6)
- Input offset voltage
 - CMRR
 - SVRR
- b) Derive the expression for the output voltage of an op amp integrator. Also calculate the gain limiting frequency. (9)
- IV Define the term comparator chatter. How does Schmitt trigger avoid chatter? Explain the working of an inverting Schmitt trigger with necessary waveforms and voltage transfer curve. (15)
- OR**
- V a) Derive the expression for the frequency response of a 2nd order low pass Butterworth filter. (10)
- b) Design a 2nd order Butterworth filter having a cut-off frequency of 1KHz. (5)
- VI Draw the block diagram of a 565 PLL, and explain the functions of major blocks. Also derive the expression for lock-in-range and capture range. (15)
- OR**
- VII a) Explain the operation of an R-2R ladder DAC with necessary circuit diagrams. (6)
- b) Draw the functional diagram of a monostable multivibrator using timer IC and explain its operation. (9)
- VIII a) Explain the rules for thin film resistor and capacitor design. (10)
- b) Distinguish between
 - Monolithic and hybrid ICs.
 - Analog and Digital IC
 (5)
- OR**
- IX a) Explain the two basic processes in thick film processing. (10)
- b) What are the major steps in the design guidelines for thick film hybrid ICs (5)

