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## ***B. Tech. Degree V Semester Examination November 2014***

### **EE 506 LINEAR INTEGRATED CIRCUITS**

(2006 Scheme)

Time: 3 Hours

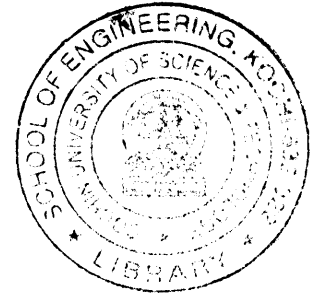
Maximum Marks: 100

#### **PART A**

(Answer *ALL* questions)

(8 x 5 = 40)

- I. (a) Draw the block diagram of a typical opamp and explain the function of each block.
- (b) What are the ideal characteristics of an opamp?
- (c) Define the terms with respect to an opamp (i) CMRR (ii) Slew rate.
- (d) Explain the operation of a voltage to current converter.
- (e) Draw and explain the working of an astable multivibrator using opamp.
- (f) Explain a sample and hold circuit.
- (g) Draw and explain the functional block diagram of a 555 timer.
- (h) What are the advantage of active filters?



#### **PART B**

(4 x 15 = 60)

- II. Draw the circuit diagram of a dual-input balanced-output differential amplifier. Derive the expression for voltage gain, input resistance and output resistance. (15)
- OR**
- III. (a) What is a current mirror? Explain the concept of constant current source used in differential amplifier. (8)
- (b) Explain the concept of virtual ground. (7)
- IV. (a) Draw the circuit diagram of a closed loop non inverting amplifier and derive the expression for voltage gain. (10)
- (b) What is a voltage follower? What are its applications? (5)
- OR**
- V. Derive the expression for the voltage gain of an instrumentation amplifier. What are its advantages? List its applications. (15)
- VI. (a) Write notes on: (i) integrator (ii) differentiator. (10)
- (b) Explain the working of a triangular wave generator. (5)
- OR**
- VII. (a) What is a precision rectifier? How is it different from an ordinary rectifier? Explain the working of a full wave precision rectifier. (10)
- (b) Explain the circuit of a peak detector. (5)
- VIII. (a) Explain how PLL can be used as a frequency multiplier. (7)
- (b) Draw and explain the working of a successive approximation ADC. (8)
- OR**
- IX. Compare Chebyshev and Butterworth filters. With neat circuit diagram derive the transfer function of a second order Butterworth high pass filter and obtain the equation for the lower cut off frequency. (15)

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