

B.Tech III Year I Semester (R13) Regular Examinations December 2015

**LINEAR IC APPLICATIONS**

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

**PART – A**  
(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

- Draw the ideal voltage transfer curve of Op amp.
- Determine the output voltage for the inverting amplifier if the gain and the input voltage of the Op amp is 1000 and 20 mV dc respectively.
- List out the properties of practical Op amp.
- Draw the frequency responses (Gain Vs frequency) of open loop and closed loop operational amplifier.
- Design a first order low pass filter at a higher cut off frequency of 1 kHz with a pass band gain of 2?
- Draw the circuit diagram of non-inverting Summing amplifier.
- Draw the circuit diagram and waveforms of zero crossing detector.
- List out the applications of MPY634.
- Define resolution and settling time.
- What are the main advantages of integrated type ADC?

**PART – B**

(Answer all five units, 5 X 10 = 50 Marks)

**UNIT – I**

- Compare different configurations of differential amplifier.
  - Draw the circuit of basic current mirror and explain its operation.

**OR**

- Draw the various functional blocks of an operational amplifier IC. Explain each block.
  - Draw the equivalent circuit diagram of Op amp and derive the expression for gain of non-inverting amplifier.

**UNIT – II**

- Explain in detail about external frequency compensation techniques with neat sketches.

**OR**

- Define slew rate and derive the expression for it.
  - Derive the input resistance and output resistance for a voltage shunt feedback amplifier.

**UNIT – III**

- Design a differentiator to differentiate an input signal that varies in frequency from 10 Hz to about 1 kHz.
  - Write short notes on V-I and I-V converters using op-amps.

**OR**

- Draw the circuit diagram of Instrumentation Amplifier and derive the expression for gain.

**UNIT – IV**

- Design a 555 Astable Multivibrator to operate at 10 kHz with 40% duty cycle.
  - Draw the block diagram of PLL and explain its operation.

**OR**

- Draw the circuit diagram of RC phase shift oscillator and derive the expression for its frequency of oscillations.

**UNIT – V**

- Draw the circuit diagram of Dual Slope ADC and explain its working with neat sketches.

**OR**

- Explain the operation of Weighted Resistor DAC with the help of circuit diagram.
  - The basic step of a 9 bit DAC is 10.3 mV. If "000000000" represents 0 V. What output is produced if the input is "101101111"?