

Code :RR310405

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**III B.Tech I Semester(RR) Supplementary Examinations, May 2011**  
**LINEAR IC APPLICATIONS**  
 (Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

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

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1. (a) Derive an expression for output impedance of a practical inverting amplifier.  
 (b) Draw the equivalent circuit diagram of non-inverting amplifier using low frequency model and explain its working.
2. (a) What is the principle used in the design of an antilog amplifier explain?  
 (b) Draw the basic logarithmic multiplier circuit and explain how it multiplies two voltages.
3. (a) Explain the operation of a Zero-crossing detector.  
 (b) Draw a neat circuit diagram of an inverting comparator as a Schmitt trigger. Derive the expressions for upper threshold and lower threshold voltages.
4. (a) Design a first order band pass filter with lower cutoff frequency of 100Hz and a higher cutoff frequency of 1KHz. The pass band gain should be 4. Calculate the 'Q' of the filter.  
 (b) Determine  $f_1$  and  $f_2$  for a second order band pass filter with a centre frequency of 1 KHz and band width = 200Hz.
5. (a) With necessary external components to a VCO IC NE556, Explain the generation of a triangular wave.  
 (b) Determine the component values for a control voltage  $V_c=9$  volts and a frequency of oscillation=10KHz. Make necessary assumptions.
6. (a) Draw the dc voltage versus phase difference characteristic of balanced modulator phase detector of a PLL indicating all important regions.  
 (b) Draw the dc output voltage of VCO versus frequency characteristic of a PLL indicating the capture and lock range clearly.  
 (c) State the relationship between lock range and capture range through a mathematical expression.
7. (a) With a suitable circuit diagram using NE 565 PLL IC, explain implementation of a FSK demodulation.  
 (b) What are the standard frequencies used for mark and space to originate and answer in FSK teletypewriter signal transmission.
8. Write short notes on:
  - (a) Operation of tracking type Analog to Digital converter.
  - (b) Flash type analog to digital converter.
  - (c) Specifications of an analog to digital converter.

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