

Code No: NR210502/RR210503

NR/RR

Set No. 2

II B.Tech I Semester Examinations, November 2010

LINEAR AND DIGITAL IC APPLICATIONS

Common to Information Technology, Computer Science And Engineering,  
Computer Science And Systems Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions  
All Questions carry equal marks

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1. (a) Give the block diagram of NE 565 PLL and explain the role of each block. Make circuit connections to track the incoming signal and explain its operations. [6]
- (b) With neat sketches, explain the following terms: [6]
  - i. Lock-in-range
  - ii. Capture range
  - iii. Pull-in time.
- (c) Sketch the capture transient and explain why it is generated before locking? [4]
2. (a) Draw the schematic circuit diagram of a Servo A/D converter and explain the operations of this system. [8]
- (b) Compare Servo A/D with other types of A/D converters. [8]
3. (a) Define Bessel, Butterworth and Chebyshev filters, and compare their frequency response. [8]
- (b) Sketch the circuit diagram of band elimination filter and design a wide band-reject having  $f_H=200\text{Hz}$  and  $f_L=1\text{kHz}$ . Assume necessary data. [8]
4. (a) What is meant by Tri-state logic ? Draw the circuit of Tri-state TTL logic and explain its functions. [8]
- (b) Draw the circuit of ECL logic OR/NOR gate and explain its functions. [8]
5. (a) What feedback is preferred for oscillators and why? What is the effect of negative feedback? [8]
- (b) Design an OP-AMP based relaxation oscillator and derive the frequency of oscillation. [8]
6. (a) Explain the differences between ac and dc amplifiers [6]
- (b) What is instrumentation amplifier? What are its features? List any three applications of instrumentation amplifier. [10]
7. Explain the operation of Monostable multivibrator using 555 timer. Derive the expression of time delay of a Monostable multivibrator using 555 timer. [16]

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8. (a) Why is it necessary to use an external offset voltage compensating network with practical OP-AMP circuits? [3]
- (b) Compare and contrast an ideal OP-AMP and practical OP-AMP. [5]
- (c) Explain the precautions that can be taken to minimize the effect of noise on an OP-AMP circuit. [5]
- (d) Calculate the effect of variation in power supply voltages on the output offset voltage for an inverting amplifier circuit. [3]

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**NR/RR****Set No. 4****II B.Tech I Semester Examinations, November 2010****LINEAR AND DIGITAL IC APPLICATIONS****Common to Information Technology, Computer Science And Engineering,  
Computer Science And Systems Engineering****Time: 3 hours****Max Marks: 80****Answer any FIVE Questions  
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1. (a) Why is it necessary to use an external offset voltage compensating network with practical OP-AMP circuits? [3]  
 (b) Compare and contrast an ideal OP-AMP and practical OP-AMP. [5]  
 (c) Explain the precautions that can be taken to minimize the effect of noise on an OP-AMP circuit. [5]  
 (d) Calculate the effect of variation in power supply voltages on the output offset voltage for an inverting amplifier circuit. [3]
2. (a) What is meant by Tri-state logic? Draw the circuit of Tri-state TTL logic and explain its functions. [8]  
 (b) Draw the circuit of ECL logic OR/NOR gate and explain its functions. [8]
3. (a) Explain the differences between ac and dc amplifiers [6]  
 (b) What is instrumentation amplifier? What are its features? List any three applications of instrumentation amplifier. [10]
4. (a) Define Bessel, Butterworth and Chebyshev filters, and compare their frequency response. [8]  
 (b) Sketch the circuit diagram of band elimination filter and design a wide band-reject having  $f_H=200\text{Hz}$  and  $f_L=1\text{kHz}$ . Assume necessary data. [8]
5. Explain the operation of Monostable multivibrator using 555 timer. Derive the expression of time delay of a Monostable multivibrator using 555 timer. [16]
6. (a) Draw the schematic circuit diagram of a Servo A/D converter and explain the operations of this system. [8]  
 (b) Compare Servo A/D with other types of A/D converters. [8]
7. (a) What feedback is preferred for oscillators and why? What is the effect of negative feedback? [8]  
 (b) Design an OP-AMP based relaxation oscillator and derive the frequency of oscillation. [8]
8. (a) Give the block diagram of NE 565 PLL and explain the role of each block. Make circuit connections to track the incoming signal and explain its operations. [6]

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- (b) With neat sketches, explain the following terms: [6]
- i. Lock-in-range
  - ii. Capture range
  - iii. Pull-in time.
- (c) Sketch the capture transient and explain why it is generated before locking? [4]

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**NR/RR****Set No. 1****II B.Tech I Semester Examinations, November 2010****LINEAR AND DIGITAL IC APPLICATIONS****Common to Information Technology, Computer Science And Engineering,  
Computer Science And Systems Engineering****Time: 3 hours****Max Marks: 80****Answer any FIVE Questions  
All Questions carry equal marks**

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1. (a) Explain the differences between ac and dc amplifiers [6]  
(b) What is instrumentation amplifier? What are its features? List any three applications of instrumentation amplifier. [10]
2. (a) What is meant by Tri-state logic ? Draw the circuit of Tri-state TTL logic and explain its functions. [8]  
(b) Draw the circuit of ECL logic OR/NOR gate and explain its functions. [8]
3. (a) Why is it necessary to use an external offset voltage compensating network with practical OP-AMP circuits? [3]  
(b) Compare and contrast an ideal OP-AMP and practical OP-AMP. [5]  
(c) Explain the precautions that can be taken to minimize the effect of noise on an OP-AMP circuit. [5]  
(d) Calculate the effect of variation in power supply voltages on the output offset voltage for an inverting amplifier circuit. [3]
4. Explain the operation of Monostable multivibrator using 555 timer. Derive the expression of time delay of a Monostable multivibrator using 555 timer. [16]
5. (a) Define Bessel, Butterworth and Chebyshev filters, and compare their frequency response. [8]  
(b) Sketch the circuit diagram of band elimination filter and design a wide band-reject having  $f_H=200\text{Hz}$  and  $f_L=1\text{kHz}$ . Assume necessary data. [8]
6. (a) Draw the schematic circuit diagram of a Servo A/D converter and explain the operations of this system. [8]  
(b) Compare Servo A/D with other types of A/D converters. [8]
7. (a) What feedback is preferred for oscillators and why? What is the effect of negative feedback? [8]  
(b) Design an OP-AMP based relaxation oscillator and derive the frequency of oscillation. [8]
8. (a) Give the block diagram of NE 565 PLL and explain the role of each block. Make circuit connections to track the incoming signal and explain its operations. [6]

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- (b) With neat sketches, explain the following terms: [6]
- i. Lock-in-range
  - ii. Capture range
  - iii. Pull-in time.
- (c) Sketch the capture transient and explain why it is generated before locking? [4]

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**NR/RR****Set No. 3****II B.Tech I Semester Examinations, November 2010****LINEAR AND DIGITAL IC APPLICATIONS****Common to Information Technology, Computer Science And Engineering,  
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1. (a) Give the block diagram of NE 565 PLL and explain the role of each block. Make circuit connections to track the incoming signal and explain its operations. [6]
- (b) With neat sketches, explain the following terms: [6]
  - i. Lock-in-range
  - ii. Capture range
  - iii. Pull-in time.
- (c) Sketch the capture transient and explain why it is generated before locking? [4]
2. (a) What feedback is preferred for oscillators and why? What is the effect of negative feedback? [8]
- (b) Design an OP-AMP based relaxation oscillator and derive the frequency of oscillation. [8]
3. (a) Explain the differences between ac and dc amplifiers [6]
- (b) What is instrumentation amplifier? What are its features? List any three applications of instrumentation amplifier. [10]
4. (a) Draw the schematic circuit diagram of a Servo A/D converter and explain the operations of this system. [8]
- (b) Compare Servo A/D with other types of A/D converters. [8]
5. (a) Why is it necessary to use an external offset voltage compensating network with practical OP-AMP circuits? [3]
- (b) Compare and contrast an ideal OP-AMP and practical OP-AMP. [5]
- (c) Explain the precautions that can be taken to minimize the effect of noise on an OP-AMP circuit. [5]
- (d) Calculate the effect of variation in power supply voltages on the output offset voltage for an inverting amplifier circuit. [3]
6. (a) What is meant by Tri-state logic ? Draw the circuit of Tri-state TTL logic and explain its functions. [8]
- (b) Draw the circuit of ECL logic OR/NOR gate and explain its functions. [8]

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7. Explain the operation of Monostable multivibrator using 555 timer. Derive the expression of time delay of a Monostable multivibrator using 555 timer. [16]
8. (a) Define Bessel, Butterworth and Chebyshev filters, and compare their frequency response. [8]
- (b) Sketch the circuit diagram of band elimination filter and design a wide band-reject having  $f_H=200Hz$  and  $f_L=1kHz$ . Assume necessary data. [8]

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