

Code No: RR310404

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SET-1

B. Tech III Year I Semester Examinations, December-2011

LINEAR IC APPLICATIONS

(ELECTRONICS AND COMMUNICATIONS ENGINEERING)

Time: 3 hours

Max. Marks: 80

Answer any five questions

All questions carry equal marks

- 1.a) Draw the internal circuit diagram of the IC 741 operational amplifier and explain the function of each stage.
 - b) What is zero offset suppression in an op-amp?
 - c) What are the non-ideal dc characteristics of a practical op-amp? [8+4+4]
- 2.a) Draw the Inverting and Non-inverting amplifier circuits of an op-amp in closed loop configuration. Obtain the expressions for the closed-loop gain in these circuits.
 - b) Draw an op-amp circuit whose output is $V_1 - V_2 + V_3 - V_4$. [8+8]
- 3.a) Draw the circuit diagram of an antilogarithmic amplifier using op-amps and explain its operation.
 - b) Explain phase difference measurement using comparator circuits. [8+8]
- 4.a) What are the advantages of active filters over passive filters?
 - b) Design a second order Butterworth low pass filter having upper cut-off frequency of 2.5kHz. [8+8]
- 5.a) Design a phase-shift oscillator using an op-amp for $f_0 = 500\text{Hz}$.
 - b) Draw the circuit of a triangular wave generator using a comparator and an integrator. Explain its operation with the output waveform. [8+8]
- 6.a) What is VCO? Explain the operation of a grounded capacitor type of VCO.
 - b) Design a monostable multivibrator using 555 timer for a pulse period of 2ms. [8+8]
- 7.a) Define capture-range, lock-range and pull-in time of PLL and also derive their expressions.
 - b) Using neat sketches, explain how a PLL can be used as frequency translator. [8+8]
- 8.a) What are the sources of analog errors in an A/D converters?
 - b) An 8-bit D/A converter has a resolution of 10mV. Find the full scale voltage and the output voltage when the input is 11000000.
 - c) Describe the operation of dual slope A/D converter with necessary diagrams. [4+4+8]

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LINEAR IC APPLICATIONS

(ELECTRONICS AND COMMUNICATIONS ENGINEERING)

Time: 3 hours

Max. Marks: 80

Answer any five questions

All questions carry equal marks

- 1.a) Draw the circuit diagram of an antilogarithmic amplifier using op-amps and explain its operation.
- b) Explain phase difference measurement using comparator circuits. [8+8]
- 2.a) What are the advantages of active filters over passive filters?
- b) Design a second order Butterworth low pass filter having upper cut-off frequency of 2.5kHz. [8+8]
- 3.a) Design a phase-shift oscillator using an op-amp for $f_0=500\text{Hz}$.
- b) Draw the circuit of a triangular wave generator using a comparator and an integrator. Explain its operation with the output waveform. [8+8]
- 4.a) What is VCO? Explain the operation of a grounded capacitor type of VCO.
- b) Design a monostable multivibrator using 555 timer for a pulse period of 2ms. [8+8]
- 5.a) Define capture-range, lock-range and pull-in time of PLL and also derive their expressions.
- b) Using neat sketches, explain how a PLL can be used as frequency translator. [8+8]
- 6.a) What are the sources of analog errors in an A/D converters?
- b) An 8-bit D/A converter has a resolution of 10mV. Find the full scale voltage and the output voltage when the input is 11000000.
- c) Describe the operation of dual slope A/D converter with necessary diagrams. [4+4+8]
- 7.a) Draw the internal circuit diagram of the IC 741 operational amplifier and explain the function of each stage.
- b) What is zero offset suppression in an op-amp?
- c) What are the non-ideal dc characteristics of a practical op-amp? [8+4+4]
- 8.a) Draw the Inverting and Non-inverting amplifier circuits of an op-amp in closed loop configuration. Obtain the expressions for the closed-loop gain in these circuits.
- b) Draw an op-amp circuit whose output is $V_1 - V_2 + V_3 - V_4$. [8+8]

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SET-3

B. Tech III Year I Semester Examinations, December-2011

LINEAR IC APPLICATIONS

(ELECTRONICS AND COMMUNICATIONS ENGINEERING)

Time: 3 hours

Max. Marks: 80

Answer any five questions

All questions carry equal marks

- 1.a) Design a phase-shift oscillator using an op-amp for $f_0=500\text{Hz}$.
b) Draw the circuit of a triangular wave generator using a comparator and an integrator. Explain its operation with the output waveform. [8+8]
- 2.a) What is VCO? Explain the operation of a grounded capacitor type of VCO.
b) Design a monostable multivibrator using 555 timer for a pulse period of 2ms. [8+8]
- 3.a) Define capture-range, lock-range and pull-in time of PLL and also derive their expressions.
b) Using neat sketches, explain how a PLL can be used as frequency translator. [8+8]
- 4.a) What are the sources of analog errors in an A/D converters?
b) An 8-bit D/A converter has a resolution of 10mV. Find the full scale voltage and the output voltage when the input is 11000000.
c) Describe the operation of dual slope A/D converter with necessary diagrams. [4+4+8]
- 5.a) Draw the internal circuit diagram of the IC 741 operational amplifier and explain the function of each stage.
b) What is zero offset suppression in an op-amp?
c) What are the non-ideal dc characteristics of a practical op-amp? [8+4+4]
- 6.a) Draw the Inverting and Non-inverting amplifier circuits of an op-amp in closed loop configuration. Obtain the expressions for the closed-loop gain in these circuits.
b) Draw an op-amp circuit whose output is $V_1 - V_2 + V_3 - V_4$. [8+8]
- 7.a) Draw the circuit diagram of an antilogarithmic amplifier using op-amps and explain its operation.
b) Explain phase difference measurement using comparator circuits. [8+8]
- 8.a) What are the advantages of active filters over passive filters?
b) Design a second order Butterworth low pass filter having upper cut-off frequency of 2.5kHz. [8+8]

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SET-4

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LINEAR IC APPLICATIONS

(ELECTRONICS AND COMMUNICATIONS ENGINEERING)

Time: 3 hours

Max. Marks: 80

Answer any five questions

All questions carry equal marks

- 1.a) Define capture-range, lock-range and pull-in time of PLL and also derive their expressions.
b) Using neat sketches, explain how a PLL can be used as frequency translator. [8+8]
- 2.a) What are the sources of analog errors in an A/D converters?
b) An 8-bit D/A converter has a resolution of 10mV. Find the full scale voltage and the output voltage when the input is 11000000.
c) Describe the operation of dual slope A/D converter with necessary diagrams. [4+4+8]
- 3.a) Draw the internal circuit diagram of the IC 741 operational amplifier and explain the function of each stage.
b) What is zero offset suppression in an op-amp?
c) What are the non-ideal dc characteristics of a practical op-amp? [8+4+4]
- 4.a) Draw the Inverting and Non-inverting amplifier circuits of an op-amp in closed loop configuration. Obtain the expressions for the closed-loop gain in these circuits.
b) Draw an op-amp circuit whose output is $V_1 - V_2 + V_3 - V_4$. [8+8]
- 5.a) Draw the circuit diagram of an antilogarithmic amplifier using op-amps and explain its operation.
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- 6.a) What are the advantages of active filters over passive filters?
b) Design a second order Butterworth low pass filter having upper cut-off frequency of 2.5kHz. [8+8]
- 7.a) Design a phase-shift oscillator using an op-amp for $f_0 = 500\text{Hz}$.
b) Draw the circuit of a triangular wave generator using a comparator and an integrator. Explain its operation with the output waveform. [8+8]
- 8.a) What is VCO? Explain the operation of a grounded capacitor type of VCO.
b) Design a monostable multivibrator using 555 timer for a pulse period of 2ms. [8+8]

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