15/05/19
FN

Reg. No. :

Question Paper Code : 80134

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Fourth Semester

Electrical and Electronics Engineering

EE 8451 — LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Common to Electronics and Instrumentation Engineering/Instrumentation and Control Engineering)

(Regulation 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define the term Encapsulation.

2. List the advantages of thin film resistors.

3. Give the various types of frequency compensation.

4. The output voltage of a certain op-amp circuit changes by 20 V in 4 μs. What is its slew rate?

5. List the four requirements of an Instrumentation amplifier.

6. Give the circuit using Op-amp for a first order low-pass filter with variable gain.

7. Determine the frequency of oscillations, if the duty cycle D = 20% and the ON period T_{on} = 2 ms.

8. Draw the output of a missing pulse detector.

9. What is a Load cell?

10. Give the seven output voltage options available in fixed voltage series regulator.

PART B — (5 × 13 = 65 marks)

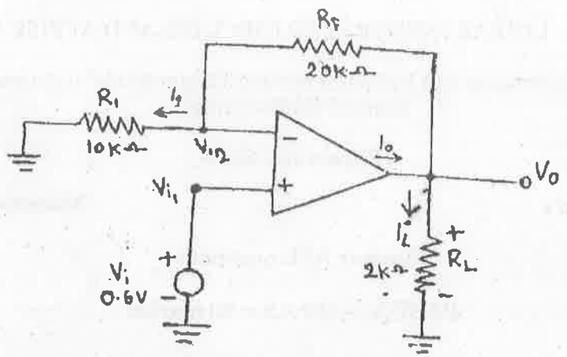
11. (a) (i) Explain the fabrication technique of FET in detail. (7)

(ii) Discuss the Photolithographic process with necessary illustrations. (6)

Or

(b) Describe the methods in Thin and Thick film technology.

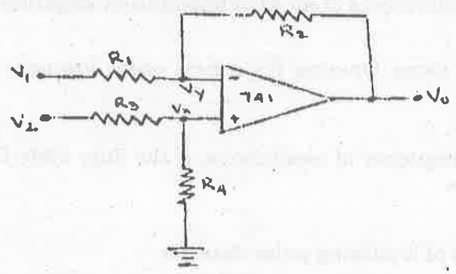
12. (a) For the given non-inverting amplifier shown in figure below, determine (i) A_v; (ii) V_0; (iii) I_L and (iv) I_0.



Or

(b) Explain with neat circuit expressions about the working of (i) Inverting Amplifiers (ii) Integrating circuit and derive the gain. (6 + 7)

13. (a) Find the following for the given Op-amp differential amplifier : (i) The gain of the amplifier (ii) The input resistance (iii) Output voltage, when the inputs are $1\sin(2000t)$ V and $1.2\sin(2000t)$ and the $R_1 = R_3 = 1.2\ \text{k}\Omega$ and $R_2 = R_4 = 22\ \text{k}\Omega$.



Or

(b) Discuss the application of Op-amps, with necessary equivalent circuits and expressions for (i) D/A converter (ii) A/D converter.

14. (a) In detail, explain the functional block and characteristics of 555 Timer with its PWM application.

Or

(b) Discuss the ICC 566 as a voltage controlled oscillator with necessary illustrations.

15. (a) Explain the Fixed voltage regulator and its applications.

Or

(b) Explain the function of SMPS with neat waveforms and schema.

PART C — (1 × 15 = 15 marks)

16. (a) With neat figures explain the design of a circuit for performing (i) square wave generation (ii) sweep signal conversion (iii) clamped signal output. (15)

Or

(b) Determine the output frequency f_0, lock range Δf_L and capture range Δf_C of IC 565. Assume $R_1 = 15\,\text{k}\Omega$, $C_1 = 0.01\,\mu\text{F}$, $C = 1\,\mu\text{F}$ and the supply voltage is +12 V. (15)

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Question Paper Code : 57310

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Third Semester

Electrical and Electronics Engineering

EE 6303 – LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

[Common to Electronics and Instrumentation Engineering and Instrumentation and Control Engineering]

(Regulations 2013)

Time : Three Hours **Maximum : 100 Marks**

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. State the limitations of 1C technology.
2. Distinguish between dry etching and wet etching.
3. Why 1C 741 is not used for high frequency applications.
4. Draw the circuit diagram of an integrator and give its output equation.
5. What is sample and hold circuit ? Where it is used ?
6. What is the advantage of using active clipper over passive clipper ?
7. Define capture range of PLL.
8. What is analog multiplier IC ? Where it is used ?
9. Why do switching regulators have better efficiency than the series regulators ?
10. Give some examples of monolithic IC voltage regulators.

PART – B (5 × 16 = 80 Marks)

11. (a) (i) Distinguish diffusion and ion Implantation process in IC fabrication. (6)

(ii) Describe the metallization process, assembly processing and packaging with neat diagram. (10)

OR

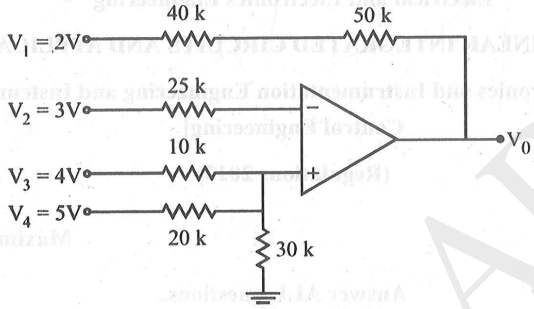
(b) Discuss briefly about the PN junction diode and JFET fabrication. (16)

12. (a) Discuss the frequency response characteristics and compensation of an operational amplifier. (16)

OR

(b) (i) Explain the application of Op-Amp as differentiator. (8)

(ii) Find V_0 for the given circuit. (8)



13. (a) (i) Design a Schmitt trigger using Op-Amp. (8)

(ii) Explain the working of successive approximation type A/D converter. (8)

OR

(b) (i) Draw the instrumentation amplifier using 3 Op-Amp and derive its output voltage equation. (8)

(ii) Explain the first order low pass butterworth filter with a neat diagram. Derive its frequency response and plot the same. (8)

14. (a) With the help of schematic diagram, explain the operation of IC-566 VCO. Also derive an expression for the output frequency. (16)

OR

(b) (i) Design and draw the waveform of a 1 kHz square wave generator using 555 timer for duty cycle of 50%. (6)

(ii) Explain the operation of astable operation of IC555 with necessary waveform. (10)

15. (a) Explain the operation of switching regulator. Give its advantages. (16)

OR

(b) Write short notes on :

(i) LM 380 power amplifier. (8)

(ii) ICL 8038 Function generator. (8)

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Question Paper Code : 71766

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Third Semester

Electrical and Electronics Engineering

EE 6303 — LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Common to Electronics and Instrumentation Engineering, Instrumentation and Control Engineering)

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

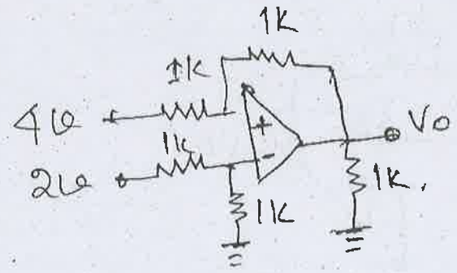
PART A — (10 × 2 = 20 marks)

1. State the advantages of CMOS circuits.

2. What is lithography?

3. Draw the circuit diagram of a symmetrical emitter coupled differential amplifier.

4. For the circuit diagram shown below determine the output voltage V_0.



5. Draw the circuit diagram of a zero cross detector with input and output waveforms.

6. Which is the fastest ADC? State reason.

7. What is an analog multiplier? Name its applications.

8. Draw the circuit diagram of a PLL circuit used as an AM modulator.

9. Give one comparison for switching regulator and variable voltage regulator.

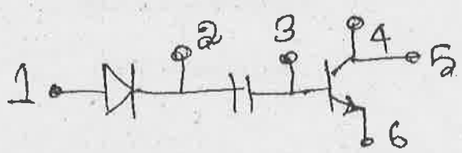
10. How are frequency of triangular waveform, obtained using ICL 8038 function generator?

PART B — (5 × 13 = 65 marks)

11. (a) With neat illustrations explain the various steps involved in the IC fabrication process. (13)

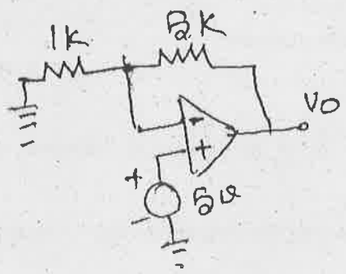
Or

(b) With circuit diagram explain the steps involved in the fabrication of the circuit shown below using IC technology. (13)

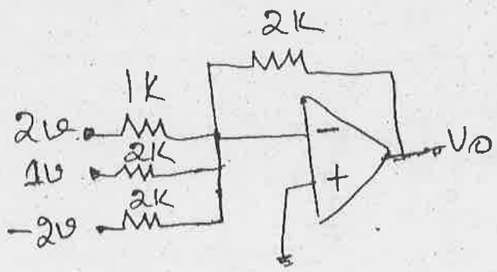


12. (a) Determine the output voltage for the following circuits. (6.5)

(i)



(ii)



(6.5)

Or

(b) (i) With diagram explain the working principle of V/I converter. (5)

(ii) Write a note on stability criterion and compensation techniques applicable to opamp circuit. (8)

13. (a) With diagram explain the following applications of op amp. (13)

(i) Clippers and clampers

(ii) Triangular waveform generator.

Or

(b) (i) Explain the working principle of R-2R ladder type D/A converter. (7)

(ii) Design a second, order Butterworth low pass filter with cut off frequency 2KHZ. (6)

14. (a) Briefly explain the functional block diagram of NE 565 PLL–IC to operate as a frequency divider. (13)

Or

(b) (i) Explain the functional block diagram of 555 timer IC. (8)

(ii) Design a monostable multivibrator with pulse duration of 1m sec using 555 timer IC. (5)

15. (a) With necessary diagram and waveforms explain the working principle of switched mode power supply. (13)

Or

(b) Write short notes on the following :

(i) LM 380 power amplifier

(ii) ICL 8038 function generator. (13)

PART C – (1 × 15 = 15 marks)

16. (a) Sketch the implementation of an instrumentation amplifier using three opamps. Explain the principle of operation and its applications. (15)

Or

(b) Using 7805 design a current source to deliver a 0.2A current to a 22 Ohm 10 w load. (15)

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Reg. No. :

Question Paper Code : 40993

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B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018

Third Semester

Electrical and Electronics Engineering

EE6303 – LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Common to Electronics and Instrumentation Engineering/Instrumentation and Control Engineering)

(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

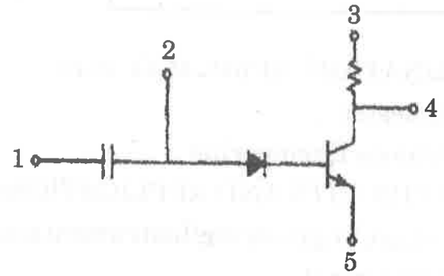
Answer ALL questions

PART – A **(10×2=20 Marks)**

1. Define the term photolithography in IC fabrication.
2. The slew rate of an op-amp is 0.6 V/micro sec. What is the maximum undistorted sine-wave that can be obtained for a 10 V peak and 1V peak ?
3. Compare the ideal and practical op-amp characteristics.
4. How an op-amp can be used as a voltage follower ?
5. Draw the diagram of a sample and hold circuit.
6. Enlist the applications of comparators.
7. Define the terms lock range and capture range with respect to PLL.
8. Mention the applications of analog multipliers.
9. What is an isolation amplifier ?
10. List the features of opto-coupler ICs.

PART – B (5×13=65 Marks)

11. a) Describe the steps involved in the fabrication of monolithic IC transistors. (13)



(OR)

b) Elaborate the fabrication of MOS ICs with suitable diagram. (13)

12. a) i) Explain the working principle of emitter coupled differential amplifier. (7)

ii) How common mode rejection ratio can be increased using constant current source ? (6)

(OR)

b) i) Draw the inverting amplifier circuit of an op-amp in closed loop configuration. Obtain the expression for the closed loop gain. (7)

ii) For a non-inverting amplifier using an op-amp assume R_1 = 470 ohm and R_2 = 4.7 kohm. Calculate the closed loop voltage gain of the amplifier. (6)

13. a) i) Design a weinbridge oscillator for a frequency of 5 kHz. Assume C = 0.01 micro farad. (4)

ii) Explain the operation of a triangular waveform generator using op-amp. (9)

(OR)

b) i) Discuss the operation of successive approximation type A/D converter. (11)

ii) What are the advantages of continuous type A/D converter over counter type A/D converter ? (2)

14. a) i) Explain the functional block diagram of NE561 phase locked loop. (7)

ii) Narrate the process of FSK demodulation using PLL. (6)

(OR)

b) Describe the working principle of the variable trans-conductance analog multiplier. (13)

15. a) i) Explain the working principle of basic linear voltage regulator using op-amp. (7)

ii) Explain the operation of a monolithic IC Class-A audio power amplifier LM380. (6)

(OR)

b) Write a detailed note on switching regulators. (13)

PART – C (1×15=15 Marks)

16. a) What are the new trends in Integrated circuit technologies and explain about its scope for future generation ?

(OR)

b) Write a note on recent fabrication methods of diode and capacitance for industrial applications.

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Question Paper Code : 52947

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Third Semester

Electrical and Electronics Engineering

EE 6303 — LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Common to Electronics and Instrumentation Engineering, Instrumentation and Control Engineering)

(Regulation 2013)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

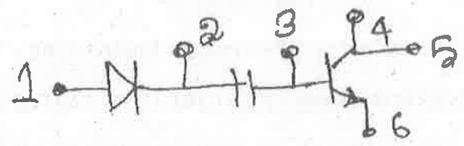
1. Write the advantages of ICs over discrete circuits.
2. How are diodes realised in IC wafer fabrication?
3. How is peak detector circuit obtained with Op–Amp?
4. Draw the circuit diagram of an integrator and give its output equation.
5. Draw the circuit diagram of a zero cross detector with input and output waveforms.
6. Which is the fastest ADC? State reason.
7. Define duty cycle in astable multivibrator using IC 555.
8. List the applications of PLL.
9. Define Line regulation and Load regulation.
10. How is +5V and –5V obtained used IC voltage regulates?

PART B — (5 × 13 = 65 marks)

11. (a) With neat illustrations explain the various steps involved in the IC fabrication process. (13)

Or

(b) With circuit diagram explain the steps involved in the fabrication of the circuit shown below using IC technology. (13)



12. (a) (i) What is Slew rate? List the causes of the Slew rate and explain its significance in applications.

(ii) Briefly explain the methods used for frequency compensation.

Or

(b) (i) Draw and explain the operation of a current to voltage converter.

(ii) What are the limitations of an ordinary op-amp differentiator? Draw the circuit of a practical differentiator that will eliminate these limitations.

13. (a) (i) Design a Schmitt trigger using Op-Amp.

(ii) Explain the working of successive approximation type A/D converter.

Or

(b) (i) Draw the instrumentation amplifier using 3 Op-Amp and derive its output voltage equation.

(ii) Explain the first order low pass butterworth filter with a neat diagram. Derive its frequency response and plot the same.

14. (a) With the help of schematic diagram, explain the operation of IC 566 VCO and derive its output frequency.

Or

(b) What is PLL? How frequency multiplication is done in PLL?

15. (a) (i) Explain the working of series voltage regulator.

(ii) Explain the working principle of IC 8038 function generator.

Or

(b) (i) What is the principle of switch-mode power supplies? Discuss its advantages and disadvantages.

(ii) With a neat diagram explain the operation of LM 380 power amplifier.

PART C — (1 × 15 = 15 marks)

16. (a) What are the new trends in Integrated circuit technologies and explain about its scope for future generation?

Or

(b) Develop an Op–Amp based signal generates to give sine wave, square wave and triangular wave output.

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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 80368

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016

Third Semester

Electrical and Electronics Engineering

EE 6303 — LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Common to Electronics and Instrumentation Engineering, Instrumentation and Control Engineering)

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the advantages of ICs over discrete circuits.
2. State the limitations of IC technology.
3. Write some applications of operational amplifier.
4. What is integrator?
5. Explain the sample and hold circuit.
6. Write the difference between active clipper and passive clipper circuit.
7. Draw the functional block of 555 timer IC.
8. Define PLL.
9. What is SMPS?
10. What are the applications of fixed voltage regulator?

PART B — (5 × 13 = 65 marks)

11. (a) (i) Describe about epitaxial growth process. (6)

(ii) Explain in detail about the Photolithography process with neat diagram. (7)

Or

(b) Write a note on masking and etching process in IC fabrication. (13)

12. (a) Discuss in detail about the DC and AC characteristics of op amp. (13)

Or

(b) Explain the differential amplifier using op amp. (13)

13. (a) Write a note on logarithmic and antilog amplifier using op amp. (13)

Or

(b) Explain the working of SAR type and Flash type A/D converter. (13)

14. (a) With the help of schematic diagram, explain the operation of IC 566 VCO and derive its output frequency. (13)

Or

(b) What is PLL? How frequency multiplication is done in PLL? (13)

15. (a) What do you mean by the fixed voltage and variable voltage regulator. List its various applications. (13)

Or

(b) Write short notes on:

(i) LM380 Power Audio Amplifier. (6)

(ii) ICL 8038 Function Generator. (7)

PART C — (1 × 15 = 15 marks)

16. (a) What are the new trends in Integrated circuit technologies and explain about its scope for future generation?

Or

(b) Write a note on recent fabrication methods of FET for industrial applications.

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 50475

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017
Third Semester
Electrical and Electronics Engineering
EE 6303 – LINEAR INTEGRATED CIRCUITS AND APPLICATIONS
(Common to : Electronics and Instrumentation Engineering/Instrumentation and Control Engineering)
(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A (10×2=20 Marks)

1. State the limitations of IC technology.
2. Distinguish between dry etching and wet etching.
3. A 100 pF capacitor has maximum charging current of 100 microampere. Calculate its slew rate.
4. What is the drawback of IC 741 ?
5. What is the use of sample and hold circuit ?
6. Write any two applications of clipper and clamper.
7. Define PULL time of PLL.
8. Where is the analog multiplier circuit used ?
9. What is an isolation amplifier ?
10. List the characteristics of opto coupler.

PART – B (5×13=65 Marks)

11. a) Explain the basic process used in silicon planar technology with neat diagram. (13)

(OR)

b) Write a note on classification of IC and IC packages. (13)

12. a) Explain the following terms in an OP-AMP :
    i) Bias current (3)
    ii) Thermal drift (3)
    iii) Input offset voltage and current (4)
    iv) Virtual ground. (3)

(OR)

b) Draw the circuit of a symmetrical emitter coupled differential amplifier and derive for CMRR. (13)

13. a) With neat diagram, explain the working principle of
    i) R-2R ladder type DAC (7)
    ii) Weighted resistor DAC (6)

(OR)

b) Draw and explain the circuit of a second order Butterworth low pass filter and derive its transfer function. (13)

14. a) i) Briefly explain the difference between the two operating modes of 555 Timer. (7)
    ii) List the important feature of 555 Timer. (6)

(OR)

b) Write a note on :
    i) Analog multipliers ii) VCO. (8+5)

15. a) Briefly explain the working principle of switch mode power supply with necessary circuit diagrams and waveforms. (13)

(OR)

b) Write short notes on :
    i) LM 380 Power Audio Amplifier (6)
    ii) ICL 8038 Function generator IC. (7)

PART – C (1×15=15 Marks)

16. a) What are the new trends in integrated circuit technologies and explain about its scope for future generation.

(OR)

b) Explain in detail the recent fabrication methods of diode and capacitance for industrial applications.

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Question Paper Code : 20449

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Third Semester

Electrical and Electronics Engineering

EE 6303 – LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Common to : Electronics and Instrumentation Engineering / Instrumentation and Control Engineering)

(Regulations 2013)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by parasitic capacitance?

2. What are the advantages of NPN transistor over PNP transistor in IC technology?

3. Write the concept of virtual ground.

4. Define slew rate.

5. How does Schmitt trigger act as a regenerative comparator?

6. Mention the drawback of Binary weighted resistor DAC.

7. List the applications of PLL.

8. What are the features of VCO?

9. What is a series voltage regulator?

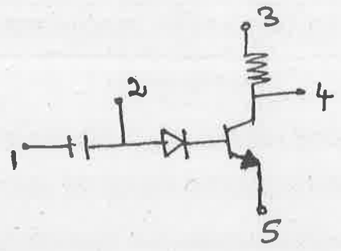
10. How current boosting is achieved in a 723 regulator?

PART B — (5 × 13 = 65 marks)

11. (a) Explain the basic processes used in silicon planar technology with neat diagram. (13)

Or

(b) Write down the various steps involved in the fabrication of a typical circuit. (13)



12. (a) Draw the circuits for inverting, non-inverting and difference amplifier using op-amp. Also derive the expressions for their gains. (13)

Or

(b) Explain the ideal and non ideal DC characteristics of an op-amp. (13)

13. (a) With circuit diagram, discuss the following applications of operational amplifier

(i) R-2R ladder type D/A converter. (8)

(ii) Peak detector. (5)

Or

(b) Explain the operation of astable multivibrator using op-amp. (13)

14. (a) With a neat block diagram explain the Operation of Voltage Controlled Oscillator. (13)

Or

(b) List the important features of the 555 timer. Also write about the two basic modes in which the 555 timer operation. (13)

15. (a) Explain the working principle of switched mode power supply. Discuss its advantages and disadvantages. (13)

Or

(b) Explain the working of series voltage regulator. (13)

PART C — (1 × 15 = 15 marks)

16. (a) (i) Draw and explain the integrater circuit using Op-amp. (6)

(ii) An inverting amplifier using the 741 IC must have a flat response upto 40 KHz. The gain of the amplifier is 10. What maximum peak-to-peak input signal can be applied without distorting the output. (9)

Or

(b) Explain with a neat block diagram and switching power supply waveforms for the following types of SMPS.

(i) Forward converter

(ii) Fly back converter. (15)

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Question Paper Code : 91482

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

Third Semester

Electrical and Electronics Engineering

EE 6303 – LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Common to Electronics and Instrumentation Engineering and Instrumentation and Control Engineering)

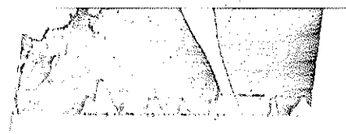
(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. Classify ICs on the basis of application, device used and chip complexity.
2. Mention different available IC package configurations.
3. What is meant by input offset current and offset voltage ?
4. Define CMRR.
5. What is sample and hold circuit ? Where it is used ?
6. What is the advantage of using active clipper over passive clipper ?
7. What is an analog multiplier ? Name its applications.
8. Draw the circuit diagram of a PLL circuit used as an AM modulator.
9. What is SMPS ?
10. What are the applications of fixed voltage regulator ?



PART – B (5×13=65 Marks)

11. a) i) Describe the Epitaxial growth process. (7)

ii) Explain the different types of IC packages. (6)

(OR)

b) Briefly explain the various process involved in fabrication monolithic IC which integrates diode, capacitance and FET.

12. a) Discuss the frequency response characteristics and compensation of an operational amplifier.

(OR)

b) i) Explain the application of Op-Amp as differentiator. (7)

ii) Find V_0 for the given circuit shown in Figure (1). (6)

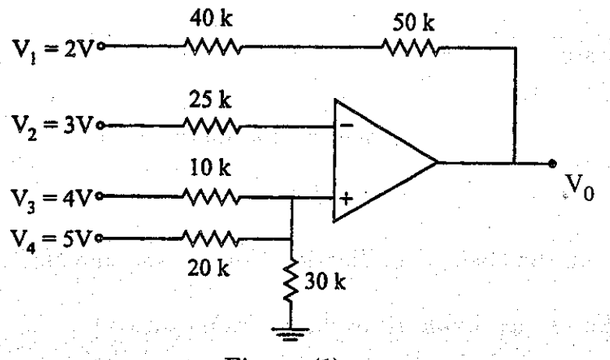


Figure (1)

13. a) i) Design a second order Butterworth Low pass filter having upper cut-off frequency of 1 KHz. (7)

ii) Explain how to measure the phase difference between two signals. (6)

(OR)

b) i) Draw a sample and hold circuit and explain its operation. (6)

ii) Design a circuit of a clipper which will clip the input signal below a reference voltage. (7)

14. a) Briefly explain the functional block diagram of NE 565 PLL-IC to operate as a frequency divider.

(OR)

b) i) Explain the functional block diagram of 555 timer IC. (6)

ii) Design a monostable multivibrator with pulse duration of 1m sec using 555 timer IC. (7)

15. a) What do you mean by the fixed voltage and variable voltage regulator ? List its various applications.

(OR)

b) Write short notes on :

i) LM380 Power Audio Amplifier. (7)

ii) ICL 8038 Function Generator. (6)

PART – C (1×15=15 Marks)

16. a) Develop an op-amp based circuits to perform following mathematical operations :

i) Integration (5)

ii) Logarithmic (5)

iii) Multiplication. (5)

(OR)

b) Develop an op-amp based instrumentation amplifier for industrial applications.

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 27208

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Third Semester

Electrical and Electronics Engineering

EE 6303 — LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Common to Electronics and Instrumentation Engineering and Instrumentation and Control Engineering)

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

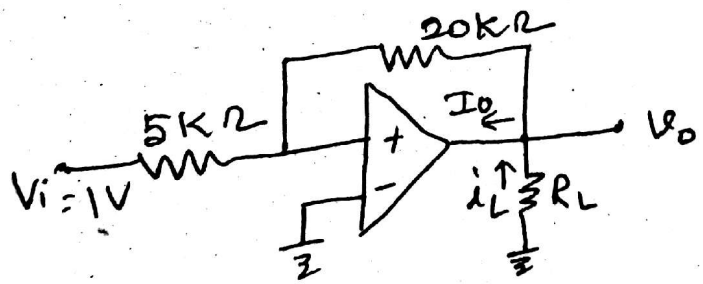
PART A — (10 × 2 = 20 marks)

1. Classify ICs on the basis of application, device used and chip complexity.

2. Mention different available IC package configurations.

3. What are the ideal characteristics of an OP — AMP?

4.

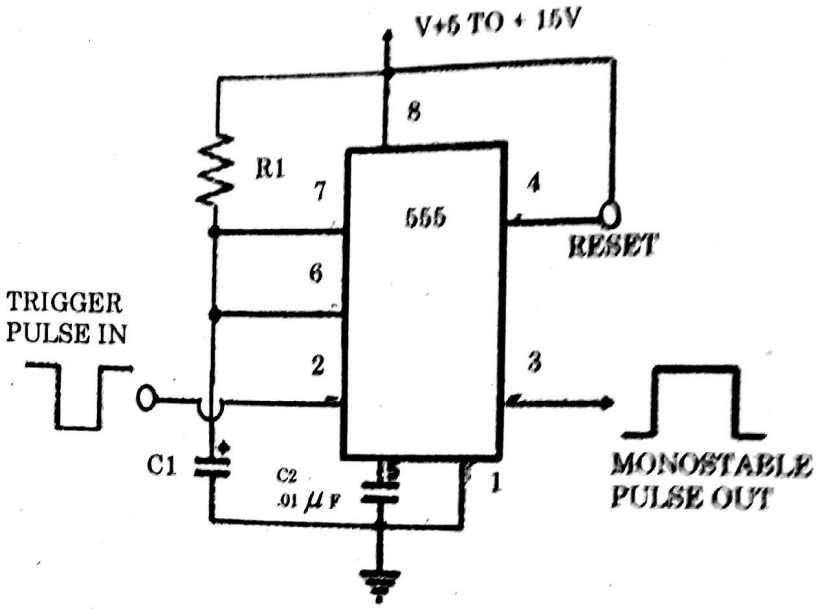


In circuit shown in above figure, calculate V_o, A_{CL}, load current i_L and output current i_o.

5. Draw the circuit of a log amplifier using two op-amps.

6. Calculate the value of the LSB, MSB and full scale output for an 8 – bit DAC for the 0 to 12V range.

7. In the Monostable multivibrator of below figure circuit R_1 = 10K Ω time delay T = 100mS. Calculate the value of C_1.



8. Define capture range and Lock-in range.

9. Define Line regulation and Load regulation.

10. What is the purpose of using an external pass transistor with an IC voltage regulator.

PART B — (5 × 16 = 80 marks)

11. (a) Explain the various steps involved in fabrication of a typical transistor into monolithic ICs. (16)

Or

(b) What is thin and thick film technology? Explain various methods used for deposition of thin film technology. (16)

12. (a) (i) What is Slew rate? List the causes of the Slew rate and explain its significance in applications. (10)

(ii) Briefly explain the methods used for frequency compensation. (6)

Or

(b) (i) Draw and explain the operation of a current to voltage converter. (8)

(ii) What are the limitations of an ordinary op-amp differentiator? Draw the circuit of a practical differentiator that will eliminate these limitations. (8)

13. (a) (i) Design a second order Butterworth Low pass filter having upper cut-off frequency of 1 kHz. (12)

(ii) Explain how to measure the phase difference between two signals. (4)

Or

(b) (i) Draw a sample and hold circuit and explain its operation. (8)

(ii) Design a circuit of a clipper which will clip the input signal below a reference voltage. (8)

14. (a) (i) Draw and explain the functional diagram of 555 timer. (10)

(ii) Discuss the operation of a FSK generator using 555 Timer. (6)

Or

(b) Draw the block diagram of a VCO and explain its operation. (16)

15. (a) (i) Draw and explain the functional diagram of 723 IC regulator. (8)

(ii) Explain fold back characteristics of 723 IC regulator. (8)

Or

(b) (i) Draw the circuit diagram of a LM 380 power audio amplifier and explain its operation. (12)

(ii) What are the applications of LM 380 power amplifier? (4)

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 77125

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2015.

Third Semester

Electrical and Electronics Engineering

EE 6303 — LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Common to Electronics and Instrumentation Engineering and Instrumentation and Control Engineering)

(Regulation 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is ion implantation? Give its advantages.

2. List the advantages of integrated circuits over discrete component circuit.

3. What do you mean by input offset current and offset voltage?

4. Define CMRR.

5. What is a Zero crossing detector?

6. Calculate the number of comparators required for realizing an 8-bit flash A/D converter.

7. Define duty cycle in astable multivibrator using IC 555.

8. List the applications of PLL.

9. What are the limitations of three terminal regulator?

10. How current boosting is achieved in a 723 IC?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe the Epitaxial growth process. (8)

(ii) Explain the different types of IC packages. (8)

Or

(b) Briefly explain the various process involved in fabrication monolithic IC which integrates diode, capacitance and FET. (16)

12. (a) (i) Design an op-amp circuit to give an output voltage $V_0 = 4V_1 - 3V_2 + 5V_3 - V_4$ where V_1, V_2, V_3 and V_4 are inputs. (8)

(ii) Explain voltage to current converter using operational amplifier. Also explain the application of OP-Amp as integrator. (8)

Or

(b) (i) Explain in detail about the methods of frequency compensation used in operational amplifiers. (10)

(ii) What is slew rate and how it can be improved? (6)

13. (a) (i) Discuss the second order high pass filter with its frequency response and design the circuit with the cut-off frequency of 5 KHz. (8)

(ii) With a neat circuit diagram, explain the working of Schmitt trigger using op-amp. (8)

Or

(b) (i) Explain the working of Instrumentation amplifier. (8)

(ii) With neat circuit diagram, explain the operation of R-2R D/A converter. (8)

14. (a) (i) With the help of neat internal function diagram explain the working of IC 555 as a astable multivibrator. (10)

(ii) In the astable multivibrator using 555 timer, $R_A = 2.2\ K\Omega$, $R_B = 6.8\ K\Omega$ and $C = 0.01\ \mu F$. Calculate t_{HIGH}, t_{LOW}, free running frequency and Duty cycle. (6)

Or

(b) (i) Explain the working of a voltage controlled oscillator. (8)

(ii) Explain how frequency multiplication is done using PLL. (8)

15. (a) (i) Explain the working of series voltage regulator. (8)

(ii) Explain the working principle of IC 8038 function generator. (8)

Or

(b) (i) What is the principle of switch-mode power supplies? Discuss its advantages and disadvantages. (8)

(ii) With a neat diagram explain the operation of LM 380 power amplifier. (8)