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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 μF. 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)

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