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Question Paper Code: 50442

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

Fourth Semester

Electronics and Communication Engineering

15UEC402 - ANALOG CIRCUITS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. The feedback signal in _____ oscillator is derived from an inductive voltage divider in the LC circuit.
(a) Hartley (b) Armstrong (c) Colpitts (d) Wein Bridge
2. The circuit with which the waveform is shaped by removing (or clipping) a portion of the input signal without distorting the remaining part of the alternating waveform
(a) Comparator (b) Clipper (c) Clamper (d) Oscillator
3. The process of introducing impurities into selected regions of a silicon wafer is called
(a) Diffusion (b) Ion implantation
(c) Lithography (d) Oxidation
4. Op-amps used as high- and low-pass filter circuits employ which configuration?
(a) non-inverting (b) comparator (c) open-loop (d) inverting
5. Find the resolution of a 12-bit DAC
(a) 4226 (b) 526 (c) 4192 (d) 1064

PART - B (5 x 3 = 15 Marks)

6. How does an oscillator differ from an amplifier? Which oscillator involves both positive and negative feedback?
7. In the monostable multivibrator, $R = 100\text{ k}\Omega$ and the time delay $T = 100\text{ ms}$. Calculate the value of C .
8. Why is aluminium preferred for metallization?
9. What is a Schmitt trigger?
10. Why is the R-2R ladder network DAC better than a weighted resistor DAC?

PART - C (5 x 16 = 80 Marks)

11. (a) Explain the operation of an RC phase shift oscillator with a neat circuit diagram and derive the expression for frequency of oscillation and the condition for sustained oscillation. (16)

Or

- (b) Draw the circuit diagram of Miller and Pierce crystal oscillators and also explain their working principle. (16)
12. (a) (i) Explain the various types of clippers and clampers with examples. (8)
(ii) Prove that an HPF is a differentiator and also prove that an LPF is an integrator. (8)

Or

- (b) With neat circuit diagram and necessary waveforms, explain the operation of a saturated collector-coupled astable multivibrator. (16)
13. (a) Explain briefly about the manufacturing process of a monolithic bipolar transistor. (16)

Or

- (b) Explain the operation of a voltage-to-current converter and an I-to-V converter with neat diagrams. (16)
14. (a) Draw a system whose gain can be adjusted by a variable resistance and explain in detail about an instrumentation amplifier. (16)

Or

- (b) Explain the operation of IC 565 PLL with its block diagram. (16)
15. (a) (i) Explain the working of successive approximation A/D converter. (8)
- (ii) Explain the working of high speed sample and hold circuit. (8)

Or

- (b) Explain the working principle of IC 723 voltage regulators with neat diagram. (16)
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