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B.E. / B.Tech. (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2014

ELECTRONICS AND COMMUNICATION ENGINEERING BRANCH

FIFTH SEMESTER

EC 283 / EC 9302 – LINEAR INTEGRATED CIRCUITS

Time: 3 hr

(REGULATIONS 2004/2008)

Max Mark: 100

Answer ALL Questions

Part – A (10 X 2 = 20 Marks)

1. Define Slew rate and also mention the methods of improving Slew rate?.
2. Design widlar current source for $I_{ref} = 1\text{ma}$ with $V_{CC} = 18\text{V}$, $V_{BE} = 0.7\text{V}$, $\beta=60$ and $I_{C2}=I_{C1}/10$.
3. Draw the Half Wave Rectifier Circuit.
4. Design an Integrator with cut-off frequency of 2kHz and draw its frequency response.
5. What is the function of Compander ICs and Where it is used?.
6. Define capture range and Pull in time.
7. A 4-bit DAC is used with reference voltage $V_R=5\text{V}$ and $K=1$. What is the output voltage if the digital input is 1001 and find the resolution.
8. Draw the fundamental Sample and Hold circuit. What is the purpose of S/H circuit in data Converters.
9. What are the advantages of Switched Mode Power Supply.
10. What is an Isolation Amplifier?

Part – B (5 X 16 = 80 Marks)

11. (i). Discuss in detail about frequency compensation of an Op-Amp. (8)
(ii). Explain the Band gap reference circuit in detail. (8)
12. (a).(i). Derive and design a second order low pass Butter-worth filter for a frequency of 1000Hz. (8)
(ii). Derive the necessary conditions for RC phase shift oscillator and design for frequency of 1500Hz. (8)

(or)

- (b). (i). Draw the Astable Multivibrator circuit using OP-AMP, and Derive the frequency of oscillations. (8)
- (ii). With neat Diagram, Explain the operation of Full Wave Rectifier circuit and derive its output voltage. (8)
13. (a). Explain the operation of four quadrant trans-conductance multiplier circuit and derive for its output with relevant diagrams. (16)
- (or)
- (b). (i). With help of neat sketch, explain the working of monolithic IC 566 VCO. (8)
- (ii). A PLL IC 565 connected for FM detection has $R_1=8.3K\Omega$, $C_1=0.001\mu F$ and $C=0.02\mu F$. The supply voltage is 12V. Determine the Free-running frequency, Capture range and Lock-range. (8)
14. (a). (i). Construct R-2R DAC and find the output for the binary word 100. (8)
- (b). (ii). Explain the working principle of Dual slope ADC with neat sketch. (8)
- (or)
- (b). (i). Describe the functions of Adaptive Delta Modulation and specify its advantages. (8)
- (ii). Discuss Voltage to frequency converter with neat diagram. (8)
15. (a). (i). Design an Astable Multivibrator using 555 for a frequency of 66KHz and a duty cycle of 70%. Assume $C=0.1\mu F$ and draw the circuit diagram. What are the possible ways in order to get perfect square wave. (10)
- (ii). Explain Opto couplers in detail. (6)
- (or)
- (b). (i). Discuss Low Voltage Regulators using IC723. (8)
- (ii). Explain Video amplifier with neat diagram. (8)