Question Paper Code : 77118

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

Fourth Semester

Electronics and Communication Engineering

EC 6404 – LINEAR INTEGRATED CIRCUITS

(Common to Medical Electronics and Robotics and Automation Engineering)

(Regulation 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. A differential amplifier has a differential voltage gain of 2000 and a common mode gain of 0.2. Determine the CMMR in dB.

2. Define Slew rate and what causes the slew rate?

3. What is hysteresis and mention the purpose of hysteresis in a comparator?

4. What is the difference between normal rectifier and precision rectifier?

5. How do you convert a basic multiplier to a squaring and square root circuit?

6. What are the applications of PLL for AM detection?

7. What would be produced by a DAC, whose output range is 0 to 10 V and whose input binary number is 10111100 (for a 8 bit DAC)?

8. What is over sampling?

9. State the two conditions for oscillation.

10. Draw the functional block diagram of 723 regulator.

PART B — (5 × 16 = 80 marks)

11. (a) (i) With simple schematic of differential amplifier, explain the function of Operational Amplifier. (8)

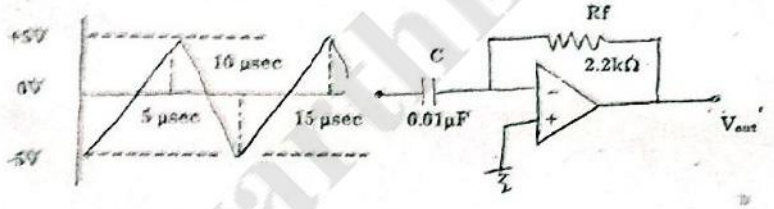
(ii) Briefly explain about constant current source. (8)

Or

(b) (i) Briefly explain the techniques used for frequency compensation. (12)

(ii) How do the open loop gain and the closed loop gain of an op-amp differ? (4)

12. (a) (i) Determine the rate of change of the output voltage in response to the first input pulse as shown below for the integrator. The output voltage is initially zero. Also describe the output after the first pulse. Draw the output waveform. (8)



(ii) Explain in detail about the V to I and I to V converters. (8)

Or

(b) (i) With neat diagram explain the operation of Schmitt trigger. (8)

(ii) Design a wide band pass filter having f_L = 400 Hz, f_H = 2 kHz and pass band gain of 4. Find the value of Q of the filter. (8)

13. (a) (i) With neat simplified internal diagram, explain the working principle of Operational Transconductance Amplifier (OTA). (10)

(ii) Explain the application of VCO for FM generation. (6)

Or

(b) Define capture range and lock range. Explain the process of capturing the lock and also derive for capture range and lock range. (16)

14. (a) Explain in detail about the following Digital to Analog conversion techniques.

(i) R-2R ladder type DAC (8)

(ii) Weighted resistor DAC (8)

Or

(b) With neat internal diagram, explain the following.

(i) Dual slope ADC (8)

(ii) Successive Approximation ADC. (8)

15. (a) (i) Design a phase shift oscillator to oscillate at 100 Hz. (6)

(ii) Describe Monostable multivibrator with necessary diagrams and derive for ON time and recovery time. (10)

Or

(b) (i) Briefly describe about monolithic switching regulators. (10)

(ii) Write short notes on Voltage to frequency converters. (6)
