B 2167

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Fourth Semester

Computer Science and Engineering

EC 244 — LINEAR INTEGRATED CIRCUITS

(Common to Electronics and Communication Engineering)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. An operational amplifier is having a DC gain of 100 when operated in closed loop mode. If the output offset voltage is 100 mV what is the input offset voltage?

2. What is the significance of PSRR in operational amplifiers?

3. Draw an op-amp circuit that can be used as a subtractor with a gain of 10 with all the components values.

4. Draw the circuit arrangement for a non-inverting amplifier for AC applications.

5. The lock range of a certain general purpose PLL with a free running frequency of 50 MHz is specified to be ± 10% what is its lock range?

6. What are the essential building blocks of a PLL?

7. Define resolution of an A/D converter.

8. When does slope overload error result in delta modulation system?

9. What is the frequency of the output waveform of an astable multivibrator using timer 555?

10. Define line regulation of a voltage regulator.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Briefly describe the important op-amp parameters. (10)

(ii) Draw and explain the working of an operational amplifier with offset-voltage compensating network. (6)

Or

(b) Explain any two types of current sources. Discuss their advantages and disadvantages.

12. (a) (i) Design an inverting amplifier whose gain is variable from unity to 100 for DC applications. Suggest a method to convert it into a non-inverting amplifier with the same gain variation. (8)

(ii) In a circuit using operational amplifiers with one input, it is desired to have two outputs, one in phase with the input and amplified by a factor of 100 and the other will be 180° out of phase with input without any amplification. Give the circuit arrangement with appropriate component values and explain. (8)

Or

(b) (i) Draw an appropriate circuit using op-amp which gives an output equal to sum of differentials of three inputs. Explain its operation by deriving an expression to prove the above stated result. (6)

(ii) Explain the working of a phase shift oscillator. (10)

13. (a) (i) Explain the working of a voltage controlled oscillator. (10)

(ii) Write notes on compander IC. (6)

Or

(b) (i) Explain the working of PLL. (8)

(ii) Explain any one application of PLL. (8)

14. (a) (i) Explain the working of R-2R ladder type digital to analog converter. (8)

(ii) Explain the working of successive approximation type analog to digital converter. (8)

Or

(b) (i) Explain the working of a voltage to frequency converter. (8)

(ii) Explain the working of a DM system using its block diagram. (8)

15. (a) (i) Explain the working of a 555 timer circuit as a monostable multivibrator. (10)

(ii) Explain current limit protection in a voltage regulator circuit. (6)

Or

(b) (i) Using an appropriate circuit explain the working of a frequency to voltage converter. (8)

(ii) Write notes on various sources of noise. (8)