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Question Paper Code : 71450

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

Fourth Semester

Electronics and Communication Engineering

EC 2254/EC 44/EC 1254/080290022/10144 EC 405 — LINEAR INTEGRATED CIRCUITS

(Regulation 2008/2010)

(Common to PTEC 2254 Linear Integrated Circuits for B.E. (Part-Time) – Third Semester ECE – Regulation 2009)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   List the characteristics of ideal OpAmp and draw its equivalent circuit.

2.   An operational amplifier has a slew rate of 4V/μs. Determine the maximum frequency of operation to produce a distortionless output swing of 12V.

3.   State reasons why integrator is called "lossy".

4.   What is a precision rectifier?

5.   Draw the circuit and characteristics of computer.

6.   Under what conditions will the Gilbert cell function as a multiplier?

7.   Compare single slope and dual slope A/D converters.

8.   Define gain error and monotonicity with respect to data converters.

9.   State the need for current limiting in voltage regulators.

10.   How does switched capacitor emulate resistor?

PART B — (5 × 16 = 80 marks)

11.   (a)   List the levels of integration in ICs. Explain with neat diagrams the various steps involved in the fabrication of monolithic BJT, resistor and capacitor.   (16)

Or

      (b)   Define the following dc characteristics of operational Amplifier   (8)
             (i)   Input bias current
             (ii)   Input offset current
             (iii) Input offset voltage

             Suggest a suitable compensation technique for each of the above.   (8)

12. (a) (i) Construct a logarithmic amplifier with op-amps and derive the expression for the output voltage. (8)

(ii) Explain the Instrumentation Amplifier circuit and obtain expression for gain. What are its applications? (8)

Or

(b) Discuss the following applications of Op Amp

(i) Current to voltage converter (8)

(ii) Schmitt Trigger. (8)

13. (a) Draw the analog multiplier IC and explain its features.

Or

(b) Explain the basic blocks of PLL and determine expressions for lock-in range and capture range.

14. (a) (i) Explain the flash type ADC. What are its merits and demerits? (10)

(ii) Write a note on high speed sample and hold circuits. (6)

Or

(b) (i) With Circuit, explain current mode type of DAC's. Compare with voltage mode type. (10)

(ii) What are oversampling data converters? (6)

15. (a) (i) How is 723 IC configured as high voltage regulator circuit? Draw the schematic and explain. (8)

(ii) Explain the monostable mode operation of IC 555 timer. (8)

Or

(b) (i) Draw the schematic of ICL 8038 function generator and discuss its features. (10)

(ii) Find the expression for frequency of a triangular waveform generator and explain the circuit. (6)

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