

Reg. No. :

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ECE
204-6

Question Paper Code : 11329

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2012.

Fourth Semester

Electronics and Communication Engineering

EC 2254/147404/EC 44/10144 EC 405/EC 1254/080290022 — LINEAR
INTEGRATED CIRCUITS

(Regulation 2008)

(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. Name the different methods used in fabrication of integrated resistors.
2. What is the maximum undistorted amplitude, that a sine wave input of 10 kHz, can produce, at the output of an op-amp whose slew rate is 0.5 V/μs?
3. Draw the circuit diagram of an op-amp differentiator circuit.
4. How does precision rectifier differ from the conventional rectifier?
5. What is a two Quadrant multiplier?
6. Define the term lock-in-range of PLL.
7. What output voltage would be produced by a D/A converter whose output range is 0 to 10 V and whose input binary number is 0110 for a 4 bit DAC.
8. What is the main drawback of dual slope ADC?
9. What are the limitations of IC 723 general purpose regulator?
10. What is power amplifier?

PART B — (5 × 16 = 80 marks)

11. (a) Draw the circuit of basic current mirror and explain its operation. Also discuss about, how current ratio can be improved in the basic current mirror. Sketch the improved circuit and explain. (16)

Or

- (b) (i) Define and explain slew rate. What is full-power bandwidth? Also explain the methods adopted to improve slew rate. (10)
- (ii) Define output off-set voltage. Explain methods to nullify off-set voltage. (6)

12. (a) With neat circuit diagrams and mathematical expressions, explain the operation of the following op-amp applications :
- (i) Scale changer. (4)
 - (ii) Voltage follower. (4)
 - (iii) Non-Inverting adder. (4)
 - (iv) Integrator. (4)

Or

- (b) With the help of circuits and necessary equations, explain how log and antilog computations are performed using IC 741. (16)
13. (a) (i) Explain, with necessary equations, the basic circuits of 'Linearized transconductance multiplier' and Differential V-I converter' Hence explain the 'Four quadrant variable transconductance multiplier' circuit. (10)
- (ii) Explain the working of a divider circuit using multiplier IC. (6)

Or

- (b) (i) Draw the block diagram of VCO and explain its operation. Also derive the frequency of oscillator. (10)
- (ii) Draw the circuit of a PLL used as AM detector and explain its operation. (6)
14. (a) Explain the following types of digital to analog converters, with suitable circuit diagrams :
- (i) Binary weighted resistor DAC. (6)
 - (ii) R-2R Ladder DAC. (5)
 - (iii) Inverted R-2R Ladder DAC. (5)

Or

- (b) (i) With a neat block diagram, explain, in detail, the successive approximation type A/D converter. (8)
- (ii) Explain the over sampling A/D converter with functional block diagram. (8)
15. (a) (i) Draw the circuit using op-amp to generate triangular wave- Explain its operation. (8)
- (ii) With a neat diagram. explain the working of step down switching regulator. (8)

Or

- (b) With a suitable circuit diagrams, explain the working of the following :
- (i) video amplifier. (8)
 - (ii) Voltage to frequency converter. (8)