VASAVI COLLEGE OF ENGINEERING (*Autonomous*), HYDERABAD
B.E. (EEE) III Year I-Semester Main & Backlog Examinations, December-2017
Linear Integrated Circuits

Time: 3 hours
Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

1. Define the following:
   i) Input offset current ii) Input bias current

2. Define Schmitt trigger? Mention few applications of the same.

3. Distinguish between AC amplifier and DC amplifier.

4. What is a peak detector?

5. What is Barkhausen criteria for the circuit to produce oscillations? Explain.

6. State the terms associated with PLL?

7. Briefly explain about fixed voltage regulator? How it is different from variable voltage regulator?

8. Mention the limitations of linear voltage regulators.

9. Why the active filters are considered to be superior over conventional passive filters? Explain.

10. What is a universal filter?

Part-B (5 × 10 = 50 Marks)
(All bits carry equal marks)

11. a) Define slew rate. How does this limit the response of an Op-amp? How can the slew rate be improved?

    b) Explain the operation of a voltage to current converter by deriving the necessary equations.

12. a) Draw the circuit of a multiplier using OP AMPS and explain its operation.

    b) Explain the operation of a half-wave precision rectifier.

13. a) Design a square wave generator to operate at a frequency of 1.5 kHz.

    b) Explain dual slope integrating type ADC.

14. a) Explain the operation of a triangular wave generator by drawing the output waveform and derive the expression for frequency of oscillations.

    b) Derive the expression for the period of a pulse generated when a 555 timer is used as a monostable multivibrator.

15. a) State the merits and demerits of active filters over passive filters.

    b) Determine i) 'Q' factor ii) f1 and f2 for a second order band pass filter with a center frequency of 1 kHz and bandwidth = 20 Hz.

16. Explain the operation of a state variable filter. Derive the transfer functions for all the filters available in it.

17. Answer any *two* of the following:

    a) Draw the functional diagram of 555 Timer.
    b) Explain Balanced Modulator.
    c) Explain voltage controlled oscillator.

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