Hall Ticket Number:

Code No. : 31301

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (E.C.E.) III Year I-Semester (Main) Examinations, Nov./Dec.-2016
Linear Integrated Circuits and Applications

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. Open loop op-amp is not suitable for linear and ac applications. Justify.
2. An Op-Amp operates as a Unity gain buffer with $3V_{p-p}$ square wave input. If Op-Amp is ideal with slew rate 0.5 V/Sec, find the maximum frequency of operation.
3. What are the applications of Voltage to Current converter with floating load?
4. With the help of an example, explain how the Op-Amp acts as an averaging amplifier?
5. Differentiate between comparator and Schmitt trigger.
6. Design all pass filter with a phase of 45^0 at a frequency of 2 KHz.
7. Draw the circuit diagram of Schmitt trigger using 555 timer.
8. Draw the pin diagram of Voltage Controlled Oscillator (VCO) IC 566.
9. Compare series and shunt regulators.
10. Define the following terms of ADCs: i) Settle time   ii) Conversion time

Part-B (5 × 10 = 50 Marks)

11. a) Explain the AC analysis of Dual Input and Balanced Output Differential Amplifier.   [6]
    b) Discuss about the Pole-Zero compensation technique used for frequency compensation of Op-Amp   [4]

12. a) Explain the operation of Sample & Hold circuit using Op-Amp.   [4]
    b) Design a practical differentiator to differentiate an input signal that varies in frequency From 10 Hz to 10 KHz. Draw the output waveform of differentiator for an input sine wave having peak to peak amplitude of 2V at 10 KHz.   [6]

13. a) Describe the working of Schmitt trigger using Op-Amp with a neat sketch.   [5]
    b) Design a 4th order Butterworth high pass filter with cut-off frequency 1 KHz.   [5]

14. a) Explain the operation of Astable multivibrator using IC 555.   [5]
    b) Derive the Capture Range of Phase Locked Loop (PLL) with detailed explanation.   [5]

15. a) Design a high voltage regulator using IC 723 whose output is 14 V and explain its operation.   [5]
    b) Explain the working of R-2R ladder type DAC circuit.   [5]

16. a) Explain the operation of IC 8038 function generator with all needed sketches.   [5]
    b) Draw the internal functional block diagram of Phase Locked Loop (PLL) IC 565 and explain the function of each block.   [5]

17. Write short notes on any **two** of the following:
    a) Instrumentation Amplifier.   [5]
    b) Precision Rectifiers.   [5]
    c) Successive Approximation ADC.   [5]

****