

**Code No: 115EC****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech III Year I Semester Examinations, March - 2017****LINEAR IC APPLICATIONS****(Electronics and Instrumentation Engineering)****Time: 3 hours****Max. Marks: 75**

**Note:** This question paper contains two parts A and B.  
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

**PART - A****(25 Marks)**

- 1.a) Give the difference between monolithic and hybrid ICs. [2]
- b) What are the characteristics of an ideal op amp? [3]
- c) What is the need for voltage regulation? [2]
- d) Draw a neat figure to explain a basic comparator. [3]
- e) Give the differences between phase shift oscillator and wein bridge oscillator? [2]
- f) Discuss the principle of oscillations. [3]
- g) Mention any two application of 555 Timer in Mono stable mode. [2]
- h) List the Important feature of 555 Timer. [3]
- i) Give a note on D/A conversion fundamentals. [2]
- j) Where do we use successive approximating type ADC? [3]

**PART - B****(50 Marks)**

- 2.a) Write short notes on classification of IC. [4+6]
  - b) Explain various DC and AC characteristics of an op-amp. [4+6]
- OR**
- 3.a) Explain the open loop and closed loop operation of an op amp.
  - b) Draw the Schematic block diagram of the basic OPAMP. Explain the Significance of virtual ground in basic inverting OPAMP. How would you explain its existence? [4+6]
- 4.a) Describe the principle operation of an Integrator and obtain the necessary equations.
  - b) Draw the circuit of instrumentation amplifier and explain various applications of it. [5+5]
- OR**
- 5.a) Draw the circuit of zero crossing detector and explain its working with relevant waveforms.
  - b) Draw and explain the features of 723 voltage regulator. [5+5]
- 6.a) Draw the circuit of square wave generator and explain its working.
  - b) Design an active first order Butterworth filter LPF with a cutoff frequency of 2 KHz and pass band gain of 4. [5+5]
- OR**
- 7.a) Explain the Wien bridge oscillator with neat waveforms.
  - b) Explain in detail the All Pass filter. [5+5]

- 8.a) Design a 555 astable multivibrator to operate at 10 kHz with 40 % duty cycle. [5+5]  
b) Explain the operation of a 565 PLL applications.

**OR**

- 9.a) Draw the circuit diagram of a PLL AM detector and explain its operation. [5+5]  
b) Describe the Working of VCO.

- 10.a) Explain the working of a Parallel A/D converters. [5+5]  
b) Explain the operation of R-2R ladder D/A converter with neat diagrams.

**OR**

- 11.a) Discuss how to control DC motor speed using 555 timer. [5+5]  
b) Explain the working of a Dual Slope Converter.

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