

**JAYA GROUPS OF INSTITUTION  
THIRUNINRAVUR 602024**

**4th Semester – B.E. / B. Tech  
Model Exam-II**

Sub. Title : **Linear Integrated Circuits**

Sub. Code : **EC6404**

Duration : **3 Hours**

Date : **12.03.2015**

Branch : **ECE**

Max. Marks : **100**

**Part A - (10 x 2 = 20) Answer all the Questions:**

1. What is a two quadrant multiplier?
2. What is a voltage controlled oscillator?
3. Draw the relation between capture range and lock range in PLL?
4. With reference to a VCO, define voltage to frequency conversion factor?
5. Give any four applications of PLL
6. What is a sample / hold circuit?
7. What output voltage would be produced by D/A converter whose output range is 0 to 10V and whose binary number is 0 1 1 0 as input for a 4 bit DAC?
8. Compare and contrast binary ladder and R-2R ladder DAC.
9. Which is the fastest ADC? State the reason
10. Define resolution of a converter?

**Part B – (5 x 16 = 80) Answer As per the Choice:**

11. (a) List and define the parameters of a multiplier IC
- (i) How the multiplier is used as voltage divider? (8m)
- (ii) How the multiplier is used as frequency doubler (8m)

**Or**

- (b) Sketch and explain the multiplier cell using emitter coupled transistor pair, prove that the output voltage is proportional to the product of the two input voltages. State the limitations of the emitter coupled pair. (16m)
12. (a) Draw the functional block schematic of NE565 PLL and explain the roles of the low pass filter and VCO . Derive the expression for the capture range and lock – in range of the PLL (16m)

**Or**

- (b) Explain with neat block diagrams how PLL is used as (i) AM detection (ii) FM detection (iii) Frequency synthesizer. (iv) FSK modulation/Demodulation. (16m)

- (a) With suitable block diagram, explain the operation of 566 voltage controlled oscillator. Also derive an expression for the frequency of output waveform generated. (16m)

Or

- (b) (i) Explain the working of a voltage to time converter (8m)  
(ii) Write notes on oversampling A/D converters. (8m).
14. (a) (i) Explain the working of a weighted resistor D/A converter. (8m)  
(ii) Discuss the operation of sample and hold circuit with circuit diagram (8m)

Or

- (b) Explain voltage mode and current mode operations of R-2R ladder type DAC. (16m)
15. (a) (i) Draw the circuit and explain the working of dual slope A/D converter (12m)  
(ii) Compare single slope and dual slope ADC. (4m)

Or

- (b) (i) Explain the working of successive approximation A/D converter. (10m)  
(ii) Explain the following types of electronic switches used in D/A converters, with suitable diagrams (i) Totem pole MOSFET switch (ii) CMOS inverter as a switch (6m)