

Code No: 115AH**R13****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech III Year I Semester Examinations, March - 2017****IC APPLICATIONS****(Electrical and Electronics 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) Define Linear and Digital ICs. [2]
- b) Classify the ICs. [3]
- c) Define CMRR. [2]
- d) What is the necessity of a sample & hold circuit? [3]
- e) List different types of Filters. [2]
- f) State the Barkhausen criterion. [3]
- g) Mention the applications of the Schmitt trigger. [2]
- h) What is the importance of Pin 5 of IC 555? [3]
- i) List the various A/D conversion techniques. [2]
- j) List the draw backs of Binary weighted Resistor technique D/A conversion. [3]

PART - B**(50 Marks)**

- 2.a) Draw the circuit diagram of Open Collector 2-input NAND gate and with the help of functional table explain its operation.
- b) Compare the characteristics of various logic families with respect to Power Dissipation, Propagation Delay, Fan-in and Fan-out. [6+4]

OR

3. Explain how CMOS-TTL interfacing can be achieved. Give the input and output levels of voltages and explain the same. [10]
4. Explain the four Differential Amplifier configurations. [10]

OR

- 5.a) The input signal to an op-amp is $0.03 \sin 1.5 \times 10^5 t$. What can be the maximum Gain of an Op-Amp with the slew rate of $0.4 \text{ V} / \mu\text{sec}$?
- b) Explain how a Multiplier can be used as a voltage divider. [5+5]
- 6.a) Discuss the amplitude stabilization of Phase shift Oscillator.
- b) Design and draw the circuit diagram of a Wein bridge Oscillator using op-amp to produce sustained oscillations of a time period of 0.1 m sec. [3+7]

OR

7. Obtain the Transfer function of the first order High pass Butter worth filter. [10]

- 8.a) Draw the circuit and explain how IC555 can be used for Pulse Position Modulation (PPM).
b) Explain the functioning of 555 in Monostable configuration. [5+5]
- OR**
9. Describe any four applications of Phase Locked Loop with the help of suitable circuit diagrams. [10]
- 10.a) Describe Parallel Comparator type ADC operation.
b) Explain the working of Inverted R-2R ladder D/A converter. [5+5]
- OR**
- 11.a) Find out the Step size and Analog output when input is 0011 and 1011. Assume $V_{ref} = +5V$.
b) Explain Successive Approximation ADC with the help of block diagram. [4+6]