

R13

Code No: 115AH

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, May - 2018

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) List the parameters which are used to compare logic families. [2]
- b) Draw the diagram of basic gate of 2 input TTL gate. [3]
- c) Define thermal drift. [2]
- d) How fast can the output of an op-amp change by 10V, if its slew rate is $1V/\mu s$? [3]
- e) What are the limitations of active filters? [2]
- f) Give the principle of operation of VCO. [3]
- g) List the applications of PLL. [2]
- h) Define pull in time and lock range of PLL. [3]
- i) What is meant by resolution of DAC? [2]
- j) What is the conversion time of counting type ADC and parallel comparator ADC? [3]

PART - B**(50 Marks)**

- 2.a) Explain the operation of a CMOS transmission gate.
 - b) Classify ICs based on application, device used and chip complexity. [5+5]
- OR**
- 3.a) Discuss the IC interfacing for the case CMOS driving TTL.
 - b) Write short notes on tristate TTL. [5+5]
- 4.a) Explain the operation of I-V converter.
 - b) Explain the operation of an integrator using op-amp. [5+5]
- OR**
- 5.a) Explain the operation of instrumentation amplifier.
 - b) Explain the operation of multiplier using op-amp. [5+5]
6. Explain the principle of operation of RC phase shift oscillator and obtain the expression for frequency of oscillation. [10]
- OR**
- 7.a) Explain the operation of triangular waveform generator using op-amp.
 - b) Design a notch filter so that $f_o = 8kHz$, $Q = 10$. Choose $C = 500pF$. [5+5]

- 8.a) Discuss the application of 555 timer as missing pulse detector.
b) Design a monostable multivibrator to produce a pulse width of 100ms. [5+5]
- OR**
- 9.a) Discuss the application of 555 timer as a pulse width modulator.
b) Draw the functional diagram of 555 timer and explain briefly. [5+5]
- 10.a) Discuss the operation of counter type ADC.
b) Explain the operation of dual slope ADC. [5+5]
- OR**
- 11.a) Explain the operation of flash type ADC.
b) Explain the operation of weighted resistor DAC. [5+5]

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