

02 02 02 02 02 02 02  
16AG15A0216

Code No: 136CH

R16

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2019

LINEAR AND DIGITAL 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 four basic building blocks of an op-amp. [2]
- b) List features of 741 op-amp. [3]
- c) Draw the block diagram of a PLL. [2]
- d) What are the advantages and disadvantages of active filter over passive? [3]
- e) Which is the fastest ADC and why? [2]
- f) What is the need for A/D and D/A conversion? [3]
- g) Which of the parameters decide the fan out? [2]
- h) Which is the fastest logic family and why? [3]
- i) List out the applications of ROM. [2]
- j) Distinguish between SRAM and DRAM. [3]

PART - B

(50 Marks)

- 2.a) Explain the working of instrumentation amplifier with suitable diagram.
- b) What is a comparator? Discuss the non inverting comparator and obtain its input and output waveforms. [5+5]

OR

- 3.a) Define the following electrical parameters: input offset voltage, input resistance, CMRR, output voltage swing and slew rate.
- b) What is an operational amplifier? Give its symbol and also draw its electrical equivalent circuit. [5+5]

- 4.a) Define capture range, lock in range and pull in time of PLL.
- b) Discuss the 555 timer in monostable operation. Also discuss the applications for it. [5+5]

OR

- 5.a) Design a high pass filter at a cutoff frequency of 1KHz with a pass band gain of 2, plot the frequency response of the filter.
- b) Explain, how to obtain triangular wave using a square wave generator. [5+5]

2 2 2 2 2 2 2

- 6.a) Explain the working of a dual slope A/D converter.
- b) Calculate the value of the L.S.B, M.S.B and full scale output for an 8-bit DAC for the 0 to 10v range. [5+5]

OR

- 7.a) Draw the circuit of weighted resistor DAC and derive expression for output analog voltage  $V_o$ .
- b) Give short notes on successive approximation ADC. [5+5]

- 8.a) Design a  $32 \times 1$  multiplexer by using  $74 \times 151$  IC and explain its operation.
- b) Discuss briefly about parallel binary adder. [5+5]

OR

- 9.a) Draw the circuit diagram of basic TTL driving CMOS and explain with the help of functional Operation.
- b) Design a two bit comparator circuit and explain its operation. [5+5]

- 10.a) Explain the internal structure of PROM and list its advantages
- b) Design MOD-16 synchronous counter using T- Flip-Flop. [5+5]

OR

- 11.a) With a neat sketch explain the shift register.
- b) Describe DRAM with an appropriate diagram and explain about its timings. [5+5]

2 2 2 2 2 2 2

2 2 2 2 2 2 2

2 2 2 2 2 2 2

2 2 2 2 2 2 2