

PRAGATI ENGINEERING COLLEGE: SURAMPALEM
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, May - 2024

ANALOG ICs AND APPLICATIONS
(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70 M

Answer ONE Question from each Unit
 All Questions Carry Equal Marks

Q. No.	Questions		BTL	CO	Marks
UNIT – I					
1.	a)	Derive the expression for voltage gain, input resistance, and output resistance of the dual input balanced output differential amplifier.	K3	CO1	7 M
	b)	What is a voltage regulator and list the basic features of 78xx series three-terminal regulators?	K2	CO1	7 M
OR					
2.	a)	With a neat sketch explain the operation of the current mirror circuit	K2	CO1	7 M
	b)	Draw the basic block diagram of a general op-amp and explain the operation of each block.	K1	CO1	7 M
UNIT – II					
3.	a)	Draw the circuit diagram of a typical instrumentation amplifier and explain why a two-stage op-amp is used in it.	K3	CO2	7 M
	b)	Describe the logarithmic amplifier in detail.	K3	CO2	7 M
OR					
4.	a)	Explain how an op-amp can be used as a differentiator and derive an expression for the output.	K3	CO2	7 M
	b)	With a neat diagram, explain the principle of operation of a triangular waveform generator using an operational amplifier.	K3	CO2	7 M
UNIT – III					
5.	a)	Design a second-order Butterworth HPF with an upper cutoff frequency of 1KHz.	K4	CO3	7 M
	b)	With a neat diagram, explain the IC1496 modulator.	K2	CO3	7 M
OR					
6.	a)	Design a wide band-reject filter with $f_H = 200\text{Hz}$ and $f_L = 1\text{KHz}$. Assume necessary data.	K4	CO3	7 M
	b)	Draw the circuit diagram of the first-order low-pass filter and plot its frequency response.	K3	CO3	7 M
UNIT – IV					
7.	a)	Explain the operation of a monostable multivibrator using a 555 timer and derive the expression for the time delay.	K2	CO4	7 M
	b)	Draw the circuit diagram of the FSK demodulator and explain its operation in detail.	K3	CO4	7 M

OR					
8.	a)	Construct the Schmitt trigger using the 555 timer and describe its operation.	K3	CO4	7 M
	b)	Draw the block diagram of PLL and explain the operation of individual blocks in detail.	K1	CO4	7 M
UNIT – V					
9.	a)	Draw the block diagram of the 3-bit R-2R ladder DAC and describe its operation	K3	CO5	7 M
	b)	Draw the circuit diagram of counter type ADC and explain its operation in detail.	K3	CO5	7 M
OR					
10.	a)	List and explain the specifications of DAC and ADC.	K1	CO5	7 M
	b)	Draw the block diagram of the dual-slope A/D converter and describe its operation.	K3	CO5	7 M