

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

April – May 2023		
(B. Tech) Program: Electronics and Telecommunication Engineering		
Scheme II		
Examination: SY Semester: IV		
Course Code: EXC403 and Course Name: Linear Integrated Circuit		
Date of Exam: 18/05/23	Duration: 2.5 Hours	Max. Marks: 60

Instructions:				
(1) All questions are compulsory.				
(2) Draw neat diagrams wherever applicable.				
(3) Assume suitable data, if necessary.				
		Max. Marks	CO	BT level
Q 1	Solve any six questions out of eight:	12		
i)	Explain the significance of virtual ground in an opamp.	2	1	U
ii)	Explain Capture range and Lock range in PLL	2	6	U
iii)	Explain the Function of Discharge Pin in IC555.	2	4	R
iv)	What are active filters? State its advantages over passive filters.	2	3	U
v)	What is monostable multivibrator? List its applications.	2	4	R
vi)	Draw the circuit diagram of Wien bridge oscillator and calculate the value of R & R _f if C=0.1μF, f=10KHz and R _i =5KΩ.	2	3	R
vii)	What is a window detector? Draw the circuit diagram of window detector.	2	4	U
viii)	List any four features of IC 723.	2	5	U
Q.2	Solve any four questions out of six.	16		
i)	Draw and explain PLL as FSK demodulator.	4	6	U
ii)	Design a summing amplifier to produce the output $V_o = - (3V_{1a} + 12 V_{1b} + 15 V_{1c} + 18 V_{1d})$. Assume the feedback resistance $R_2 = 20 \text{ Kohm}$.	4	1	A
iii)	Describe the circuit operations of the following V-I converters, Grounded load V –I convertor.	4	2	U
iv)	With a neat circuit diagram. Explain the working of the comparator circuit.	4	3	U

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V)	Write a short note on the pulse position modulator using IC 555.	4	4	R
Vi)	Compare linear and switching voltage regulator.	4	5	U
Q.3	Solve any two questions out of three.	16		
i)	Design the Astable Multivibrator using IC555 to provide output square Wave with frequency of 5KHz, for duty cycle of. a)75% b)50%	8	4	A
ii)	Draw and explain the functional diagram of the IC723 voltage regulator.	8	5	U
iii)	List the important requirements of Instrumentation amplifier and hence derive the gain equation of 2 opamp instrumentation amplifier.	8	1	R
Q.4	Solve any two questions out of three.	16		
i)	Design 2 nd order KRC BPF with center frequency of 1 KHZ and bandwidth of 100 HZ. Also calculate resonance gain.	8	2	A
ii)	Design an inverting Schmitt trigger with following specification $V_{UTP} = +3V$ and $V_{LTP} = -1V$, for $V_0 = 20\sin\omega t$ with $V_{sat} = \pm 12 V$, draw output waveform and transfer characteristics.	8	3	A
iii)	Draw block diagram of VCO and also explain application of VCO as frequency modulator.	8	6	U
