

**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 I (KT Exam)		
Examination: SY Semester: IV		
Course Code: <b>1UEXC403</b> and Course Name: <b>Linear Integrated Circuit</b>		
Date of Exam: 30/05/23	Duration: 3 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
<b>Q 1</b>	<b>Solve any six questions out of eight:</b>	12		
i)	Draw inverting amplifier and non-inverting amplifier circuit also mention the gain formula .	2	1	U
ii)	Explain Lock range in PLL.	2	6	U
iii)	Explain the Function of trigger Pin in IC555.	2	4	R
iv)	Write the reason why opamp is not recommended in open loop configuration for amplifier application?	2	3	U
v)	Draw functional block of operational amplifier.	2	1	R
vi)	What are the limitations of ideal integrator? Suggest remedy to overcome the limitations of it.	2	3	R
vii)	Write design steps for HPF.	2	2	U
viii)	Explain 78XX and 79XX with neat diagram.	2	5	U
<b>Q.2</b>	<b>Solve any four questions out of six.</b>	16		
i)	Design the RC phase shift oscillator for $f_0 = 100\text{Hz}$ .	4	2	U
ii)	Design a 2 <sup>nd</sup> order KRC high pass filter circuit for cut off frequency of 1 KHz. and $Q=5$ .	4	3	A
iii)	Describe the circuit operations of the following V-I converters, Floating load V –I convertor.	4	1	U
iv)	Draw block diagram of IC 555.	4	4	U



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V)	Draw pin diagram IC 723.	4	5	R
Vi)	Draw VCO block diagram and explain .	4	6	U
Q.3	<b>Solve any two questions out of three.</b>	16		
i)	Design an astable multivibrator using IC 555 having an output frequency of 10 KHz with duty cycle of 75 %. How will you modify this circuit to get 50 % duty cycle?	8	4	A
ii)	Draw the block diagram and explain the operation of the switching Regulator.	8	5	U
iii)	List the important requirements of Instrumentation amplifier and hence derive the gain equation of 3 opamp instrumentation amplifier .	8	1	R
Q.4	<b>Solve any two questions out of three.</b>	16		
i)	Design a second order low pass filter using OP AMP at cut-off frequency of 1KHz and with pass band gain at 2.	8	2	A
ii)	Design an inverting Schmitt trigger to achieve hysteresis of 7 Volts. Assume voltage swing = $\pm 12$ Volts.	8	3	A
iii)	What is difference between normal and precision rectifier. Explain full wave precision rectifier with neat circuit diagram and waveform. Also derive the expression for output voltage	8	3	U

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