

**BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE  
(AUTONOMOUS)**

***I - M.Tech. II-Semester Regular Examinations (BR23), July/Aug - 2025***

**Mixed Signal & RF IC Design (VLSI)**

Time: 3 hours

Max. Marks: 75

***Answer any Five Questions One Question for One UNIT***

***ALL the Question Carry Equal Marks***

<b>UNIT-I</b>		<b>Marks</b>	<b>CO</b>	<b>BL</b>
1.a)	Explain the operation of a switched-capacitor circuit with a neat diagram.	7M	C121.1	2
b)	Differentiate between parasitic-sensitive and parasitic-insensitive integrators with examples.	8M	C121.1	4
<b>OR</b>				
2.a)	Design a basic switched-capacitor circuit using Op-Amps.	7M	C121.1	3
b)	Compare the noise performance of resistor-based and switched-capacitor circuits.	8M	C121.1	4
<b>UNIT-II</b>		<b>Marks</b>	<b>CO</b>	<b>BL</b>
3.a)	Calculate offset and gain error in a 10-bit A/D converter.	7M	C121.2	3
b)	Compare resistor-capacitor hybrid and DAC-based SAR converters.	8M	C121.2	4
<b>OR</b>				
4.a)	Illustrate how a charge redistribution A/D converter operates.	7M	C121.2	3
b)	Analyze the trade-off between speed and accuracy in successive approximation A/D converters.	8M	C121.2	4
<b>UNIT-III</b>		<b>Marks</b>	<b>CO</b>	<b>BL</b>
5.a)	Demonstrate the working of a loop filter in a PLL system.	7M	C121.3	3
b)	Compare first-order and second-order PLL models.	8M	C121.3	4
<b>OR</b>				
6.a)	Critically assess the limitations of second-order small-signal PLL models.	7M	C121.3	5
b)	Differentiate between adjacent period jitter and period jitter.	8M	C121.3	4
<b>UNIT-IV</b>		<b>Marks</b>	<b>CO</b>	<b>BL</b>
7.a)	Use sensitivity and dynamic range to determine receiver performance.	7M	C121.4	3
b)	Analyze the impact of technology choice in RF system design.	8M	C121.4	4
<b>OR</b>				
8.a)	Explain the concept of time variance in RF circuits.	7M	C121.4	2
b)	Compare analog and digital RF system architectures.	8M	C121.4	4
<b>UNIT-V</b>		<b>Marks</b>	<b>CO</b>	<b>BL</b>
9.a)	Compare various wireless communication standards.	7M	C121.5	4
b)	Discuss complexity comparison in RF technologies.	8M	C121.5	2
<b>OR</b>				
10.a)	Describe the working principle of a down conversion mixer.	7M	C121.5	2
b)	Use case studies to demonstrate amplifier performance under varying conditions.	8M	C121.5	3

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