



# SNS COLLEGE OF TECHNOLOGY



(An Autonomous Institution)

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COIMBATORE-641 035, TAMIL NADU

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Code & Name : **23ECB203 LINEAR INTEGRATED CIRCUITS**

Course Faculty : **Ms.V.Aishwarya-AP/ECE**

### Question Bank

#### **Unit – III : ANALOG MULTIPLIER AND PHASE LOCKED LOOP (PLL)**

##### **Part A - 2 Mark Questions**

S.No	Question	Bloom's Level	Industry Reference/GATE QP	CO
1	Define an analog multiplier.	BL1 – Remember	Analog Devices	CO3
2	What is the principle of operation of an analog multiplier?	BL1 – Remember	IC Design Manuals	CO3
3	What is Gilbert cell?	BL1 – Remember	RF IC Design	CO3
4	Define variable transconductance technique.	BL1 – Remember	Analog IC Design	CO3
5	Mention any two analog multiplier ICs.	BL1 – Remember	AD633, MPY634	CO3
6	List any two applications of analog multipliers.	BL1 – Remember	Communication Systems	CO3
7	Define Phase Locked Loop (PLL).	BL1 – Remember	Communication Electronics	CO3
8	List the basic blocks of a PLL.	BL1 – Remember	PLL IC Datasheets	CO3
9	What is the function of a phase detector?	BL1 – Remember	RF Systems	CO3
10	What is a Voltage Controlled Oscillator (VCO)?	BL1 – Remember	Frequency Control Circuits	CO3
11	Define lock range of a PLL.	BL1 – Remember	Communication Systems	CO3
12	Define capture range of a PLL.	BL1 – Remember	PLL Design	CO3
13	What is loop filter in a PLL?	BL1 – Remember	Control Systems	CO3
14	What is frequency synthesizer?	BL1 – Remember	RF Communication	CO3
15	Mention any two applications of PLL.	BL1 – Remember	Industrial Electronics	CO3
16	Define AM detection using PLL.	BL1 – Remember	Communication Receivers	CO3
17	What is FM detection using PLL?	BL1 – Remember	Communication Systems	CO3
18	Define FSK modulation.	BL1 – Remember	Digital Communication	CO3
19	Define FSK demodulation using PLL.	BL1 – Remember	Digital Communication	CO3
20	What is monolithic PLL IC 565?	BL1 – Remember	IC 565 Datasheet	CO3

### Part B Questions

S.No	Question	Bloom's Level	Industry Reference/Gate QP	CO
1	Explain the operation of an analog multiplier using emitter-coupled transistor pair (Gilbert cell).	BL2 – Understand	Analog IC Design	CO3
2	Explain the variable transconductance technique used in analog multipliers.	BL2 – Understand	IC Design Manuals	CO3
3	Describe the characteristics and applications of analog multiplier ICs.	BL2 – Understand	AD633, MPY634	CO3
4	Explain the basic operation of Phase Locked Loop with neat block diagram.	BL2 – Understand	Communication Systems	CO3
5	Analyze the closed-loop operation of a PLL.	BL4 – Analyze	Control Systems	CO3
6	Explain the working of Voltage Controlled Oscillator (VCO).	BL2 – Understand	Frequency Control Circuits	CO3
7	Describe the operation and features of monolithic PLL IC 565.	BL2 – Understand	IC 565 Datasheet	CO3
8	Explain the application of PLL for AM detection.	BL3 – Apply	Communication Receivers	CO3
9	Explain FM detection using PLL with necessary diagrams.	BL3 – Apply	Communication Systems	CO3
10	Explain FSK modulation and demodulation using PLL.	BL3 – Apply	Digital Communication	CO3
11	Explain frequency synthesis using PLL.	BL2 – Understand	RF Communication	CO3
12	Compare lock range and capture range of a PLL.	BL4 – Analyze	PLL Design	CO3
13	Analyze the performance parameters of a PLL.	BL4 – Analyze	Communication Electronics	CO3
14	Design a PLL-based FM demodulator.	BL3 – Apply	Communication Industry	CO3
15	Explain the applications of analog multipliers in communication systems.	BL2 – Understand	Communication Electronics	CO3
16	Explain the principle of operation of a Gilbert cell multiplier.	BL2 – Understand	GATE EC	CO3
17	Derive the expression for VCO output frequency in a PLL.	BL3 – Apply	GATE EC	CO3
18	Analyze the lock range and capture range of a PLL.	BL4 – Analyze	GATE EC	CO3
19	Explain the working of PLL as an FM demodulator.	BL3 – Apply	GATE EC	CO3
20	Explain frequency synthesis using PLL with neat block diagram.	BL2 – Understand	GATE EC	CO3