GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER–IV EXAMINATION – WINTER 2025

Subject Code:3141002   **Date:13-11-2025**
Subject Name:Analog Circuit Design
Time:02:30 PM TO 05:00 PM   **Total Marks:70**
Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define following terms. SVRR, Slew Rate, Input Offset Voltage.	**03**
	(b)	Draw and explain VTC of OP-AMP.	**04**
	(c)	Explain OP-AMP functionality as comparator.	**07**
Q.2	**(a)**	Derive gain expression for inverting closed loop amplifier using OP-AMP.	**03**
	(b)	Explain subtractor using OP-AMP.	**04**
	(c)	Write and explain sample and hold amplifier using three OP-AMP.	**07**
		OR	
	(c)	Explain peak detector circuit operation using OP-AMP.	**07**
Q.3	**(a)**	Explain circuit made up of OP-AMP that does scaling of inputs.	**03**
	(b)	Explain band pass filter using OP-AMP.	**04**
	(c)	Explain 2nd order low pass butter worth filter using OP-AMP with derivations.	**07**
		OR	
Q.3	**(a)**	Define following terms. Lock and Capture Range for PLL, Frequency Stability for Oscillators.	**03**
	(b)	Explain class B power amplifier.	**04**
	(c)	Draw and explain saw tooth wave generator using OP-AMP.	**07**
Q.4	**(a)**	Explain I to V converter using OP-AMP.	**03**
	(b)	Explain phase shift oscillator using OP-AMP in detail.	**04**
	(c)	Explain CE short-circuit current gain with resistive load R_L.	**07**
		OR	
Q.4	**(a)**	Explain voltage limiter circuit using OP-AMP with suitable example.	**03**
	(b)	Draw and explain class AB power amplifier.	**04**
	(c)	Derive relationship between expressions of h-parameter and Hybrid – π model.	**07**
Q.5	**(a)**	Design Monstable multivibrator for T_P = 11 millisecond, take C = 0.01 microferad.	**03**
	(b)	Write short note on voltage regulator.	**04**
	(c)	Explain applications of A-stable multivibrator using Timer IC.	**07**
		OR	
Q.5	**(a)**	Explain Schmitt trigger circuit using OP-AMP.	**03**
	(b)	Design A-stable multivibrator using IC 555 for Ton = 50% of T, take F= 10 KHz, C = 0.01 microferad.	**04**
	(c)	Explain block diagram of IC 555 timer.	**07**

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