Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (OLD) EXAMINATION – WINTER 2018

Subject Code:141101 **Date: 05/12/2018**

Subject Name: Advance Electronics

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.**

			MARKS
Q.1	**(a)**	Draw hybrid π equivalent circuit for common emitter transistor. Also derive the expression for input conductance (gb'e)..	**07**
	(b)	What is feedback? List the advantages of negative feedback. Derive relation between gain with and without feedback in a transistor amplifier.	**07**
Q.2	**(a)**	Explain briefly the following terms: (1)Virtual Ground concept of OP-AMP (2) "Barkhausen criteria" for oscillator circuit.	**07**
	(b)	Draw hybrid – π circuit for a single stage CE transistor amplifier having load resistance R_L and obtain expression for short-circuit current gain and bandwidth.	**07**
		OR	
	(b)	Define the following terms: : (1) Common Mode Gain (2) Differential Gain (3) PSRR (4)Noise margin (5) fan-out (6) Common Mode Rejection Ratio (7)Figure of merit for logic families	**07**
Q.3	**(a)**	Three cascaded stages amplifier have an upper 3 dB frequency of 16 KHz and a lower 3 dB frequency of 25 Hz. What are the values of f_L and f_H of each stage? Assume that all the stages are identical. Also calculate the bandwidth of each stage.	**07**
	(b)	Explain in detail two stages RC coupled amplifier with its frequency response.	**07**
		OR	
Q.3	**(a)**	For the voltage amplifier A_V = 140, f_L=200 Hz, f_H = 200 KHz, R_i = 2KΩ, Ro = 4.7KΩ. When negative feedback is employed in it with β = 0.4, determine the A_{vf}, R_{if}, R_{of}, F_{LH}, F_{HF}.	**07**
	(b)	Explain important characteristics of ideal Op-Amp.	**07**
Q.4	**(a)**	Draw the symbol and AC equivalent circuit of a Crystal oscillator and explain the principle of operation of Crystal Oscillator.	**07**
	(b)	What is the significance of CMRR? List and explain the methods to improve the CMRR.	**07**
		OR	
Q.4	**(a)**	Draw the equivalent circuit of a practical OP-AMP and explain the significance of each component shown in it.	**07**
	(b)	Draw op-amp based Wien bridge oscillator. Obtain frequency of oscillation and discuss amplitude stabilization for the same.	**07**

Q.5	**(a)**	What is Digital to Analog Convertor? Draw and Explain R-2R DAC? Also give the advantages and disadvantages of R-2R Digital to Analog convertor.	**07**
	(b)	Explain in detail two input TTL-NAND Gate (Totempole Output)	**07**

OR

Q.5	**(a)**	Tabled the compare of TTL,CMOS, and ECL logic families based on speed, fan-in, fan-out, noise immunity, power dissipation, and application.	**07**
	(b)	Explain working of successive approximation ADC with block diagram.	**07**

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