Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–III • EXAMINATION – SUMMER.2015

Subject Code: X31101 **Date: 29/05/2015**

Subject Name: Advance Electronics

Time:02.30pm-05.30pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Draw the hybrid –pi model for CE configuration and explain it. **07**

(b) Discuss general characteristics of negative feedback amplifier. **07**

Q.2 **(a)** Derive the expression for the CE short-circuit current gain A_i as a function of frequency. Define f_β and f_T. **07**

(b) Discuss the effect of an emitter bypass capacitor on Low frequency response for single stage CE amplifier. **07**

OR

(b) When a negative feedback is applied to an amplifier with gain 100, the overall gain reduces to 50. **07**

(i) Calculate the fraction of negative feedback (β)

(ii) If this fraction is maintained, calculate the value of amplifier gain required if the overall gain with feedback is to be 75.

Q.3 **(a)** Define Distortion in an amplifier. Explain all type of Distortion. **07**

(b) Write a short note on Wien Bridge Oscillator. **07**

OR

Q.3 **(a)** Sketch the high frequency step response of low pass single pole amplifier. Establish the relationship between rise time t_r and high 3 dB frequency f_H. **07**

(b) Derive the expression for input and output resistance for Voltage-series feedback topology. **07**

Q.4 **(a)** Write a short note on Barkhausen criteria for sinusoidal oscillation. **07**

(b) Define following terms **07**

(i) Input bias current (ii) Input offset current

(iii) Input offset voltage (iv) output offset voltage

(v) CMRR (vi) slew rate

(vii) PSRR

OR

Q.4 **(a)** What is phase shift oscillator? Draw the circuit diagram of RC phase shift oscillator and derive the equation of frequency of oscillation. **07**

(b) What are the characteristics of ideal OP-AMP? Derive the gain of inverting amplifier. **07**

Q.5 **(a)** Define following terms: **07**

(i) Fan in (ii) Fan out (iii) Noise Margin (iv) Propagation delay

	(b)	What is ADC? Mention various types of ADC. Explain successive approximation type ADC.	**07**

OR

Q.5	**(a)**	Why digital to analog conversion is important? Explain weighted register type DAC.	**07**
	(b)	Compare DTL, TTL and DCTL logic families.	**07**

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