

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER- IV (Old) EXAMINATION – WINTER 2019****Subject Code: 141101****Date: 13/12/2019****Subject Name: Advance Electronics****Time: 10:30 AM TO 01:00 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)** List the parameter those affecting to the transistor at high frequencies. Draw hybrid π model equivalent circuit for common emitter transistor and explain it. **07**
- (b)** Explain how the performance of an amplifier improves with negative feedback? Derive the expression of voltage gain and input impedance of voltage series feedback. **07**
- Q.2 (a)** Derive current gain of common emitter with resistive load (R_L). Draw frequency response of it with effect of R_L . **07**
- (b)** What is Common Mode Rejection Ratio (CMRR)? What is the significance of CMRR? List and Explain the methods to improve the CMRR. **07**
- OR**
- (b)** Define the following terms: : **07**
(1) Common Mode Gain (2) Differential Gain (3) Virtual Ground concept of OP-AMP (4) Noise margin (5) fan-out (6) PSRR (7) Figure of merit for logic families
- Q.3 (a)** Four identical amplifier stages are cascaded. The lower and upper 3 dB frequencies of each stage are 40Hz and 20Khz respectively. Calculate the overall bandwidth of the cascaded amplifier. **07**
- (b)** Draw and explain two stages RC coupled amplifier. List the parameters affecting the low frequency response of RC coupled amplifier. **07**
- OR**
- Q.3 (a)** If an amplifier has a bandwidth of 200 KHz and a voltage gain of 100, what will be the new bandwidth and gain if 5% negative feedback is introduced? What is the product of gain and bandwidth before and after the negative feedback? **07**
- (b)** Explain important characteristics of ideal Op-Amp. **07**
- Q.4 (a)** Draw the circuit of RC phase shift oscillator and explain the principle of operation of RC phase shift oscillator. **07**
- (b)** Draw OP AMP based close loop inverting amplifier with input output waveform. Derive the gain equation of inverting amplifier. **07**
- OR**
- Q.4 (a)** Draw the internal block diagram of OP-AMP and explain function of each block. **07**
- (b)** What is oscillator? Explain the concept of oscillation with Barkhausen criteria. **07**
- Q.5 (a)** What is Digital to Analog Convertor? Draw and Explain weighted resistor DAC. **07**

- (b) Explain Resistor Transistor Logic and Direct Coupled Transistor Logic with advantages and disadvantages. **07**

OR

- Q.5** (a) Mention the types of ADC and describe successive approximation types of ADC. **07**
- (b) Tabulated the compare of TTL, CMOS, and ECL logic families based on speed, fan-in, fan-out, noise immunity, power dissipation, and application. **07**

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