

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV • EXAMINATION – WINTER • 2014****Subject Code: 141101****Date: 29-12-2014****Subject Name: Advance Electronics****Time: 02:30 pm - 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.

- Q.1 (a)** Draw hybrid π equivalent circuit for common emitter transistor. Also derive the expression for input conductance ($g_{b'e}$). **07**
- (b)** Write a short note on two stages RC – Coupled amplifier. **07**
- Q.2 (a)** Define the following terms: **07**
- (1) Rise time (3) Non linear distortion (5) CMRR (7) Tilt
(2) Noise margin (4) Slew rate (6) Fan out
- (b)** Draw the basic block diagram of op-amp and explain each block. **07**
- OR**
- (b)** What is an op-amp? List out the characteristics of ideal op-amp. Derive the expression of voltage gain for closed loop inverting amplifier. **07**
- Q.3 (a)** Draw and explain current series feedback amplifier. **07**
- (b)** Define positive and negative feedback. Also derive the expression of transfer gain with positive and negative feedback with the use of block diagram. **07**
- OR**
- Q.3 (a)** Derive output resistance for voltage shunt feedback amplifier and current shunt feedback amplifier. **07**
- (b)** List out the steps to identify feedback topology and analysis of a feedback amplifier. **07**
- Q.4 (a)** Classify the oscillator. Also explain RC-phase shift oscillator with neat circuit diagram. **07**
- (b)** In a transistorized Hartley oscillator the two inductances are 2mH and 20 μ H while the frequency is to be changed from 950kHz to 2050 kHz. Calculate the range over which the capacitor is to be varied. **07**
- OR**
- Q.4 (a)** What is an oscillator? State and derive the Barkhausen criterion required for oscillation. **07**
- (b)** What is differential amplifier? Draw and explain emitter coupled differential amplifier. **07**
- Q.5 (a)** Give the comparison between various logic families. **07**
- (b)** Write short note on: 3-bit R-2R ladder type DAC. **07**
- OR**
- Q.5 (a)** Classify the logic families. Draw and explain 2-input DTL NAND gate. **07**
- (b)** Draw and explain the counter type A/D converter. **07**
