

GUJARAT TECHNOLOGICAL UNIVERSITY

P.D.D.C Sem-III Examination May 2011

Subject code: X31101

Subject Name: Advance Electronics

Date: 18/05/2011

Time: 10.30 am – 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.

- Q.1** (a) Write short note on hybrid π model for a transistor in CE configuration and its circuit components. **07**
 (b) Obtain the expression for the input resistance and output resistance of an amplifier with current series feedback. **07**
- Q.2** (a) Derive the formula for frequency of RC phase shift oscillator. **07**
 (b) (i) An amplifier consists of 3 identical stages in cascade; the bandwidth of overall amplifier extends from 20 Hz to 20 kHz. Calculate the bandwidth of individual stage. **04**
 (ii) List out any six characteristics of Op-amp. **03**
- OR**
- (b) Write short note on two stage RC coupled amplifier. **07**
- Q.3** (a) An amplifier with open loop gain of $A=2000 \pm 150$ is available. It is necessary to have the amplifier whose voltage gain varies by not more than $\pm 0.2\%$. Calculate β and A_f . **07**
 (b) Define the following terms for the Op-amp : **07**
 1. Input offset voltage 2. Input resistance
 3. CMRR 4. PSRR
 5. Output voltage swing. 6. Slew rate.
 7. Bandwidth
- OR**
- Q.3** (a) Explain Transfer characteristics of a differential amplifier. **07**
 (b) What is piezoelectric effect? Draw and explain A.C. equivalent circuit of a crystal. **07**
- Q.4** (a) Explain performance parameters of Digital to Analog Converter. **07**
 (b) Give the comparison between various logic families. **07**
- OR**
- Q.4** (a) Give the applications of D/A converters. **07**
 (b) Explain principle of operation and disadvantages of Counter type A/D Converter. **07**
- Q.5** (a) What is need of constant current bias circuit? Explain different constant current bias circuits. **07**
 (b) Explain R-2R ladder type DAC. **07**
- OR**
- Q.5** (a) (i) A flash type 5-bit ADC has a reference voltage of 20 V. How many voltage comparators and resistors are required? **03**
 (ii) Explain concept of oscillation with Barkhausen criteria. **04**
 (b) Draw the Block diagram of successive approximation A/D converter and explain its operation in detail. **07**
