4E2086

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# 4E2086

**B. Tech. (Sem. IV) (Main / Back) Examination, June/July - 2013**
**Electronics Instrumentation & Control**
**4IC2 Analog Electronics (Old Back)** (Common for 4IC2, 4EC2)

Time : 3 Hours] [Total Marks : 80
[Min. Passing Marks : 24

*Attempt any five questions, selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*
*Units of quantities used/calculated must be stated clearly.*

Use of following supporting material is permitted during examination.
*(Mentioned in form No. 205)*

1. NIL 2. NIL

## UNIT - I

1 (a) What are the four possible topologies of a feedback amplifier ? Identify the output signal $X_o$ and Feedback signal $X_f$ for each topologies (either as current or voltage) 8

(b) List the five characteristics of an amplifier which are modified by negative feedback. Explain them in brief. 8

**OR**

1 (a) Draw and explain the circuit of a current - series feedback amplifier. 8

(b) List the steps required to carry out the analysis of a feedback amplifier. Explain in brief. 8

## UNIT - II

2 (a) Sketch and explain the circuit of Schemitt trigger using a bi-polar function transistor. 8

(b) Give the two Barkhausen conditions required in order for sinusoidal oscillations to be sustained. Also draw neat diagrams. 8



**OR**

2 (a) Sketch the circuit for a Wein briedge Oscillator. What determines the frequency of Oscillation ? Will Oscillations take place if the bridge is balanced ? 8

(b) Sketch the topology for a generalized resonant - circuit Oscillator, using impedance $Z_1$, $Z_2$, $Z_3$. At what frequency will the circuit Oscillate ? 8

## UNIT - III

3 (a) Draw the small signal high frequency CE model of a transistor. Explain the same. 8

(b) What is the physical origin of the two capacitors in the hybrid - model ? What is the order of magnitude of each capacitance ? 8

**OR**

3 (a) Derive the expression for the CE short circuit current gain Ai as a function of frequency. 8

(b) Define $f_b$, $f_T$. What is the relationship between $f_b$ and $f_T$. 8

## UNIT - IV

4 Write short note on any two :

(a) Band Pass Amplifier

(b) Double Tuned Transformer Coupled Amplifier

(c) Stagger Tuned Amplifier

(d) Parallel resonant circuits.

8+8

## UNIT - V

5 (a) Explain quasi complementary symmetry amplifiers.

8

(b) Draw the diagram of a transformer coupled single - transistor output stage, and explain the need for impedance matching.

8

OR

5 (a) Explain why even harmonics are not present in a push-pull amplifier. Give two additional advantages of this circuit over that of a single transistor amplifier.

8

(b) Show that the maximum conversion efficiency of the idealized class B push pull circuit is 78.5%.

8