

AIM

The aim of this course is to familiarize the student with the analysis and design of feed back amplifiers, oscillators, tuned amplifiers, wave shaping circuits, multivibrators and blocking oscillators.

OBJECTIVES

On completion of this course the student will understand

- The advantages and method of analysis of feed back amplifiers
- Analysis and design of RC and LC oscillators, tuned amplifiers, wave shaping circuits, multivibrators, blocking oscillators and time based generators.

UNIT 1 FEEDBACK AMPLIFIERS 9

Block diagram. Loop gain. Gain with feedback. Desensitivity of gain. Distortion and cut off frequencies with feedback. The four basic feedback topologies and the type of gain stabilized by each type of feedback. Input and Output resistances with feedback. Method of identifying feedback topology, feedback factor and basic amplifier configuration with loading effect of feedback network taken into account. Analysis of feedback amplifiers. Nyquist criterion for stability of feedback amplifiers.

UNIT II OSCILLATORS 9

Barkhausen Criterion. Mechanism for start of oscillation and stabilization of amplitude. Analysis of Oscillator using Cascade connection of one RC and one CR filters. RC phase shift Oscillator. Wienbridge Oscillator and twin-T Oscillators. Analysis of LC Oscillators, Colpitts, Hartley, Clapp, Miller and Pierce oscillators. Frequency range of RC and LC Oscillators. Quartz Crystal Construction. Electrical equivalent circuit of Crystal. Crystal Oscillator circuits.

UNIT III TUNED AMPLIFIERS 9

Coil losses, unloaded and loaded Q of tank circuits. Analysis of single tuned and synchronously tuned amplifiers. Instability of tuned amplifiers. Stabilization techniques. Narrow band neutralization using coil. Broad banding using Hazeltine neutralization. Class C tuned amplifiers and their applications. Efficiency of Class C

tuned Amplifier.

UNIT IV WAVE SHAPING AND MULTIVIBRATOR CIRCUITS 9

RL & RC Integrator and Differentiator circuits. Diode clippers, clampers and slicers. Collector coupled and Emitter coupled Astable multivibrator. Monostable multivibrator. Bistable multivibrators. Triggering methods. Storage delay and calculation of switching times. Speed up capacitors. Schmitt trigger circuit.

UNIT V BLOCKING OSCILLATORS AND TIMEBASE GENERATORS 9

Monostable and Astable Blocking Oscillators using Emitter and base timing. Frequency control using core saturation. Pushpull operation of Astable blocking oscillator i.e., inverters. Pulse transformers. UJT sawtooth generators. Linearization using constant current circuit. Bootstrap and Miller saw-tooth generators. Current time base generators.

TUTORIAL 15

TOTAL : 60

TEXT BOOKS

1. Millman and Halkias. C., "Integrated Electronics", Tata McGraw-Hill 1991,(I,II).
2. Schilling and Belove, "Electronic Circuits", TMH, Third Edition, 2002 (Unit - III)
3. Millman J. and Taub H., "Pulse Digital and Switching waveform", McGraw-Hill International (UNIT – IV & V)
4. Robert L. Boylestead and Louis Nasheresky, 8th edn., PHI, 2002.

REFERENCES

1. Sedra / Smith, "Micro Electronic Circuits" Oxford university Press, 2004.
2. David A. Bell, " Solid State Pulse Circuits ", Prentice Hall of India, 1992.