

ELECTRONICS CIRCUIT ANALYSIS

UNIT-I

SMALL SIGNAL HIGH FREQUENCY TRANSISTOR AMPLIFIER MODELS:

BJT: Transistor at high frequencies, Hybrid-common emitter transistor model, Hybrid conductance, Hybrid - capacitance, validity of hybrid model, determination of high-frequency parameters in terms of low-frequency parameters, CE short circuit current gain, current gain with resistive load, cut -off frequencies, frequency response and gain band width product.

FET: Analysis of common source and common drain amplifier circuits at high frequencies.

UNIT-II

MULTI STAGE AMPLIFIER: Classification of amplifiers, methods of coupling, cascaded transistor amplifier and its analysis, analysis of two stages RC coupled amplifier, high input resistance transistor amplifier, boot-strap emitter follower, analysis of multi stage amplifiers using FET, differential amplifier using BJT.

UNIT-III

FEEDBACK AMPLIFIER: Feedback principle and concept, type of feedback, classification of amplifiers, feedback topologies, characteristics of negative feedback amplifiers, generalized analysis of feedback amplifiers, performance comparison of feedback amplifiers, method of analysis of feedback amplifiers.

UNIT-IV

OSCILLATORS: Oscillator principle, condition for oscillations, types of oscillators, RC-phase shift and wein bridge oscillators with BJT and FET and their analysis of LC oscillators, Hartely and colpitts oscillators with BJT and FET and their analysis, crystal oscillators, frequency and amplifier stability of oscillators.

UNIT-V

POWER AMPLIFIER: Classification of amplifiers, class A power amplifier and their analysis, Harmonics distortions, class B push-pull amplifier and their analysis, complementary symmetry push pull amplifier, class AB power amplifier, class-C power amplifier, thermal stability and heat sinks, Advanced power amplifiers, distortion in amplifiers.

UNIT-VI

TUNED AMPLIFIER: Introduction, Q-factor, small signal tuned amplifier, capacitance coupled single tuned amplifier, double tuned amplifier, effect of cascading single tuned amplifiers on band width, effect of cascading double tuned amplifiers on band width, staggered tuned amplifier, stability of tuned amplifiers, wide band amplifiers.

TEXT BOOKS:

1. Integrated Electronics – J. Millman and C.C. Halkias, Mc Graw-Hill, 1972.
2. Electronic Devices and Circuits - Salivahanan, N.Suresh Kumar, A. Vallavaraj, TATA McGraw Hill, Second Edition
3. Electronics Devices and Circuits – B.V.Rao, K.R.Rajeswari, P.C.R.Pantulu, K.B.R.Murthy, Pearson publications.

REFERENCES:

1. Electronic Devices and Circuits Theory – Robert L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall, 10th Edition, 2006.
2. Micro Electronic Circuits – Sedra A.S. and K.C. Smith, Oxford University Press, 6th edition.
3. Electronic Circuit Analysis and Design – Donald A. Neaman, Mc Graw Hill.
4. Electronics circuit principles and application-R.D.S.Samuel, B.Sujatha, Elsevier publications.
5. Electronics circuits I-Ravish R singh-Pearson publications.