Vidyalankar

S.E. Sem. IV [ETRX]

Electronic Circuits Analysis and Design

SYLLABUS

Time : 3 Hrs.

Theory : 100 Marks
Term Work : 25 Marks
Practical : 50 Marks
Oral : 25 Marks

1. **Frequency Response of Amplifiers :**
   High frequency parameters of BJT, Amplifier Frequency Response, System Transfer Functions, S–Domain Analysis, First – Order Functions, Bode Plots, Short–Circuit and Open–Circuit Time Constants, high Frequency Response of BJT, FET and MOSFET amplifier analysis.

2. **Oscillators :**
   Analysis and Design of phase shift, Quadrature, Wien bridge, Hartley, Colpitt and Crystal oscillator.

3. **Power Amplifiers :**
   Power amplifiers, Power transistors–power BJTs, power MOSFETs, design of class–A, class–AB, push pull class–B Transformer Coupled push pull Amplifier, complementary class B Power Amplifier. Heat sinks, design of heat sinks, for power amplifier devices.

4. **Differential Amplifiers :**
   BJT, FET and MOSFET differential amplifier analysis and design, design of CMOS, Differential Amplifier with Active Load.

5. **Multistage Amplifiers :**
   Design two stage BJT, JFET and MOSFET amplifiers and design of CASCODE amplifiers. Design of BJT-JFET hybrid amplifier.

6. **Feedback and Stability :**
   Introduction to basic feedback concepts, Ideal close-loop gain, Gain sensitivity bandwidth extension, Noise sensitivity, Reduction of Non-linear Distortion, Ideal Feedback Topologies, Analysis of Series-Shunt, Series-Series, Shunt-Shunt, Shunt-Series amplifiers, Loop gain, stability of the feedback circuit, The stability problem, Bode plots of one – pole, two – pole and three–pole amplifiers, Nyquist stability criterion, Phase and gain margins, Frequency compensation basic theory, Closed loop frequency response, Miller compensation.

References :

1. Microelectronics Circuits (Analysis and Design) *(Mohammad Rashid, Cengage Learning)*
2. Electronic Circuit Analysis and Design, Second edition *(Donald A. neamen)* McGraw Hill International edition 2001
3. Electronic Design, Fourth Edition *(Martin Roden, Gordon Carpenter, William Wieserman)*Shroff Publishers, 2002
4. Electronic Circuits Discrete and Integrated, Third Edition *(Donald Schilling & Charles Belove)* McGraw Hill International edition, 1989
5. Microelectronic Circuits, Fourth edition *(Adel Sedra & Kenneth Smith)* Oxford University Press, 1998

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