Vidyalankar

S.E. Sem. IV [BIOM]

Electronic Circuit Analysis and Design–II

SYLLABUS

Time : 3 Hrs.

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

1. **Feedback and Stability :**
   Introduction to Feedback, Basic Feedback Concepts, Ideal Close–Loop Gain, Gain Sensitivity Bandwidth Extension, Nose Sensitivity, Reduction of Non–Linear Distortion, Ideal Feedback Topologies, Series–Shunt, Shunt–Series, Series–Series, Shunt–Shunt Configurations, Voltage (Series–Shunt) Amplifiers, Current (Shunt–Series) Amplifiers, Trans–Conductance (Series –Series) Amplifiers, Trans–Resistance (Shunt–Shunt) Amplifiers, Loop Gain, Stability of Feedback Circuit, The Stability Problem, Bode Plots, 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.

2. **Output Stage and Power Amplifiers :**
   Power Amplifier, Power Transistors–Power B.J.T'S Power MOSFETs, Heat Sinks, Design of Heat sinks, Classes of Amplifiers, Class–A Operation, Class–B Operation, Class AB Operation, Class C Operation, Class–A Power Amplifiers, Class –AB Push Pull Complementary Output Stages., Power amplifier designing.

3. **Operational amplifiers :**
   Basics of operational amplifiers, open loop and closed loop response, Application of op–amps (Non–linear applications): viz, inverting and non inverting amplifiers, voltage follower, adder, substractor, differentiator and integrator, Comparators, clippers and clampers, Schmitt triggers, precision rectifiers, peak detectors, Log and Antilog amplifiers, gyrator, Current to voltage and voltage to current converters, Instrumentation and isolation amplifiers, transducer Bridge amplifiers. General op–amp circuit design and detailed circuit description.

4. **Sinusoidal oscillators using opamps :**
   Phase shift oscillators, Wein bridge oscillators, Tuned circuit oscillators, Colpitts oscillators and Hartely oscillators.

5. **Voltage references and voltage regulators :**
   Basics and types of voltage regulators. Performance specifications, voltage references voltage reference applications, linear regulators and their applications, IC 78XX, 79XX, LM317, IC 723, switching regulators and monolithic switching regulators Switching mode power supply, DC to DC convertors.

References :

1. Electronic Circuit Analysis and Design *(Donald A. Neamen)*
2. Electronic Devices and circuits (*R. Bolystead)*
3. Op–Amps and linear integrated circuits *(R. Gayakwad)*
4. Integrated Electronics *(Millman Halkias)*
5. Opamps and linear integrated circuits, Theory and Applications *(James Fiore)*

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