Unit - I

Chapter 1 : Fundamentals of Operational Amplifier (Op-Amp) 1-1 to 1-26

Syllabus : Operational amplifier, Equivalent circuit, Circuit symbols and terminals, Op-Amp IC-741 pin diagram and pin function, Op-Amp parameters : Input offset voltage, Input offset current, Input bias current, Differential input resistance, Input capacitance, Input voltage range, Offset voltage adjustment range, Common Mode Rejection Ratio (CMRR), Supply Voltage Rejection Ratio (SVRR), Slew rate, Large signal voltage gain, Supply voltage, Supply current, Output voltage swing, Gain bandwidth product, Output short circuit current. Transfer characteristics - Ideal and practical voltage transfer curves. Op-Amp configurations : Open loop and closed loop, Virtual ground concept, Features, Pin diagram and pin function of dual Op-Amp IC 747.

Unit - II

Syllabus : Closed loop configuration, Modes of operations : Inverting and non inverting, Differential amplifier, Unity gain amplifier (Voltage follower), Arithmetic operations : Addition, Scaling, Averaging, Subtraction, Integrator, Differentiator, Concept of frequency compensation of OP-AMP and offset nulling.

Syllabus : OP-Amp as an instrumentation amplifier : Working, Derivation of output voltage, IC LM 324 - Pin configuration, Specifications and applications. Voltage to current converter with floating and grounded load, Current to voltage converter, Sample and hold circuit, Logarithmic and antilogarithmic amplifiers using diodes, Analog divider and analog multiplier.

Syllabus : Filters and its classification, Merits and demerits of active filters over passive filters, Filter characteristic terms : Order of filter, Cut off frequency, Passband, Stopband, Centre frequency, Roll off rate, Bandwidth, Q factor, Filter types and its frequency response : Low pass (First order and second order), Highpass (First order and second order) Bandpass (Wide and narrow), Band reject (Wide and narrow), All pass filter.

Syllabus : Oscillator types using IC 741 : Phase shift oscillator, Wien bridge oscillator, Colpitts oscillator, Hartley oscillator.

Syllabus : IC 555 : Block diagram of timer, Pin diagram and functions, Astable, Monostable, Bistable multivibrator, Schmitt trigger and voltage controlled oscillator.

Unit - V

Syllabus : Phase lock loop (PLL) : Block diagram and its operation, Lock range and capture range, Applications of PLL : PLL as multiplier, FM demodulator, IC 565 : Pin diagram and function.

❑❑❑