EX-405 ELECTRONIC DEVICES AND CIRCUITS-II

Unit I Operational Amplifiers:

Design aspects of Monolithic OpAmps, ideal characteristics,specifications, offset voltages and currents, frequency compensation techniques, measurement of opamp parameters, applications of op-amp inverting, non inverting amplifiers, integrators, function generator, logarithmic amplifier, instrumentation amplifiers, signal conditioning circuits, multi- vibrators, square wave generator, rectifiers, peak detectors & voltage regulator.

Unit II

Filters: Active filters, LPF, HPF, BPF, BEF, All pass filter, higher order filters & their design, switched capacitor filters, 555 timer and its applications, 556 function generator IC and its applications, phase locked ICs (PLL) 565 and their applications. IC 1496 (Balanced modulator applications).

Unit III

Acoustics: Microphones – Carbon, moving coil, ribbon, crystals condenser, their working principle and characteristic, Noise Figure and sensitivity and shielding. Loud Speakers – Moving

Coil, electrodynamics horn type, multi-way speaker system, cross over network and their frequency characteristic. Various types of sound recording, magnetic recording, disk and crystal recording, Reverberations, building and studio acoustics, high fidelity.

Unit IV

Microwave: Generation of microwave by tubes, limitation of conventional tubes, Klystron amplifiers, reflex Klystron oscillator, magnetrons, traveling wave tube (TWT), backward wave oscillator (BWO), high frequency limitation of transistor, microwave transistor, Manley Rowe relations, parametric amplifiers and frequency multipliers, Gun effect, Gun diode oscillator, Avalanche effect, IMPATT & TRAPATT, BARRITT, TUNNETT, MITATT, microwave field effect transistors, MASER, LASER, Microwave Integrated Circuits (MICs) diode, Schottky barrier and backward diodes, PIN diode and their applications.

Unit V

Logic Families: DTL, ITL, ECL, TTL, MOS Logic Families, parameters and their comparison, transistor logic, interfacing of logic families, Integrated transistor, FET and MOS as switches, switching speed of integrated diode, transistor, FET devices, comparison between TTL and DTL, multi emitter transistor, Characteristics of TTL with Shottkey devices, transfer characteristics of ECL, Fan in and Fan out speed of operation, logic versatility of ECL gates, temperature compensated bias MOS, CMOS and their transfer characteristics, MOS invertors, CMOS inverter, rise and fall time in CMOS gates, interfacing BIT and CMOS gates.

References:

1. Tobbey; OP- Amps their design and Application
2. Gaikward RA; OP- Amp and linear Integreted circuits; PHI
3. Salivahanan; Linear Integrated Circuits; TMH
4. Kennedy J; Principles of communications; TMH
5. R.G.Gupta; Audio and Video System; TMH
6. Linear Integrated Circuits :D. Raychowdhary and Shail Jain
7. Introduction to System Design using Integrated ckt: B.S. Sonde (New Age Pub.).
8. Micro Electronics :Jacob Millman (ISE)
9. Integrated Circuits :Botkar (Khanna)
10. Applications of linear Integrated circuits :Clayton
11. Microwave Design and Circuits :S.L. Liao (PHI)
12. Microwaves and Radar :A.K. Maini (Khanna)

List of Experiments (Expandable):

1. Char. of Op-Amp (input offset voltage, slew rate CMRR, BW, Input bias current)
2. Linear application of OP-Amp (voltage follower, inviting and non-inverting amplifier and their frequency response adder subtractor differential amplifier, integrator and differential frequency response)
3. Study of Op-Amp as a comparator
4. Design of Schmitt trigger
5. Design of monoastable & astable multivibrator
6. To construct and plot frequency response of low & high pass filter.

NOTE- - All experiments (wherever applicable) should be performed through the following steps.
Step 1: Circuit should be designed/ drafted on paper.
Step 2: Where ever applicable the designed/drafted circuit should be simulated using Simulation S/W (TINA-V7/ PSPICE/ Labview/ CIRCUIT MAKER etc.).
Step 3: The designed/drafted circuit should be tested on the bread board and compare the results with the simulated results.
Step 4: Where ever required the bread board circuit should be fabricated on PCB.