

# HEMCHANDRACHARYA, NORTH GUJARAT UNIVERSITY, PATAN

## B.E. FIRST YEAR (EC, IT, CE, MC, BM)

### IT 105: ELEMENTS OF ELECTRICAL ENGINEERING AND ELECTRONICS

(In force from June 2006)

Teaching Scheme		Examination Scheme				
Theory Hrs.	Practical Hrs.	Theory Hrs.	Theory Marks	Pract./Viva Marks	Termwork Marks	Total Marks
2	1	3	100	-	25	125

D.C. Circuit: Effect of temp on resistance, Solution of D.C. circuit including series, parallel and star-delta combination of resistance. Application of Kirchhoff's law (KVL and KCL). Use of Thevenin's, Norton's, Superposition theorem for D.C. circuit.

Work, Power and Energy: Work, power and energy relationship in electrical, thermal and mechanical system units.

Capacitor: Types of capacitor, Series, Parallel combination and related circuit calculation with respect to D.C supply. Charging and discharging of capacitor. Energy stored in capacitor.

Electromagnetics: Magnetic circuit, comparison between electrical and magnetic circuit, series-parallel magnetic circuit calculation, magnetic hysteresis, hysteresis and eddy current losses, magnetic materials, statically and dynamically induced e.m.f, co-efficient of self and mutual inductance, co-efficient of coupling, series-parallel combination of inductance, rise and decay of current in inductive circuit, force experienced by current carrying conductor placed in magnetic field.

A.C. Fundamentals: Generation of alternating voltage and current, their equations, various types of waveform, definition-R.M.S. average value. Vector representation of alternating quantities, addition and subtraction of vector-complex algebra

A.C. Circuit: Phasor relationship between voltage and current in each of resistance, inductance and capacitor. A.C. series and parallel circuit power and power factor, method of circuit solution (analytically and vectorially), resonance in series and parallel circuit.

Poly-phase Circuit: Generation of poly-phase voltage, 3-phase system, phase sequence, inter connection of 3-phases voltage, current and power relationship in balance 3-phase circuit, power measurement in 3-phase and 1-phase circuit.

Electronics: Impurities in semi-conductor, N-type and P-type semiconductors, P-N junction and its properties, crystal diode and application in fullwave Rectifier circuit, characteristics of zener diode and tunnel diode working and application of special diode like LED, varactor diode, photo diode and photo transistors, CRO and its application for measurement of voltage, frequency and power factor, use of multiplier.

Term Work: Term work shall be based on the above syllabus.

Text Books:

Electrical Technology Vol-1 By B.L.Theraja

Basic Electrical Engineering By V.N.Mittal

Electronics made simple By V.K.Mehta