B.Sc. (ELECTRONICS) – I year
Semester - I
Paper - I: Circuit Analysis

Total number of hours: 48
No of hours per week: 4

UNIT - I

AC Fundamentals: Sinusoidal wave – average and RMS values – J-Operator – Polar and Rectangular forms of complex numbers – Phasor diagram – Complex impedance and admittance.

Kirchhoff's Current and Voltage Laws: Concept of voltage and current sources - KVL and KCL - application to simple circuits (AC and DC) consisting of resistors and sources – Node voltage analysis and mesh analysis.

UNIT-II

Network Theorems (DC and AC): Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Reciprocity theorem, Milliman's theorem,
Application to simple Networks.

UNIT-III

RC and RL circuits: Transient response of RL and RC circuits with step input, Time constants. Frequency response of RC and RL circuits,Types of filters – Low pass filter and High pass filter-frequency response, passive differentiating circuit and passive integrating circuit.

UNIT-IV

Resonance: RLC Series and parallel resonance circuits – Resonant frequency – Q-Factor – Bandwidth – Selectivity.

Cathode Ray Oscilloscope: Cathode ray tube (CRT) and its working – electron gun focusing – deflection sensitivity – florescent screen – Measurement of time period, frequency, phase and amplitude.

Text Books:

1) Basic Electronics – Grob, 10th edition(TMH)
2) Circuit Analysis – P .Gnanaswamy, Pearson Education.
3) Circuit and Networks – A. Sudhakar & S. Pallri (TMH)
4) Pulse, digital & switching waveforms – Milliman &Taub.
5) Networks, Lines and Fields – John D Ryder (PHI)
6) Network theory – Smarajit Ghosh (PHI)

Dr. B. Venkatram Reddy
Chairman, Board of Studies in Physics, KU, Wgl
Date: 24th Aug., 2016 & 5th June, 2017

B.Sc. (Electronics Practicals) – I year
Semester - I
Paper – I:: Circuit Analysis Practical Lab

1. Measurement of peak voltage and frequency using CRO.
2. Measurement of phase using CRO.
3. Thevenin's theorem and Norton's theorem – verification.
4. Maximum power transfer theorem – verification.
5. CR circuit – Frequency response - (Low-pass and High-pass).
6. CR and LR circuits – Differentiation and integration – tracing of waveforms.
7. LCR – Series resonance circuit – frequency response – Determination of resonant frequency (f_r), Q-factor and band width.
8. Simulation: i) Verification of KVL and KCL.
   ii) Verification of network theorems.
   iii) Study of frequency response (LR).

Note: Student has to perform minimum of six experiments.

Reference Books:

1) Lab manual for Electronic Devices and Circuits – 4th Edition. By David A Bell – PHI
2) Basic Electronics – A Text Lab Manual – Zbar, Malvino, Miller.

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