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ELECTRICAL CIRCUIT ANALYSIS-II 23EE3T02

Pre-requisite: Analysis of DC and Single phase AC Circuits, Concepts of differentiation and integration.

Course Objectives:
- To understand three phase circuits
- To analyse transients in electrical systems
- To evaluate network parameters of given electrical network
- To apply Fourier analysis to electrical systems
- To understand graph theory for circuit analysis and to understand the behaviour of filters

Course Outcomes:

At the end of the course, student will be able to,

CO1: Analyse the balanced and unbalanced 3 phase circuits for power calculations.

CO2: Analyse the transient behaviour of electrical networks in different domains.

CO3: Estimate various Network parameters.

CO4: Apply the concept of Fourier series to electrical systems.

CO5: Analyse the filter circuit for electrical circuits.

UNIT - I

Analysis of three phase balanced circuits:

Phase sequence, star and delta connection of sources and loads, relation between line and phase quantities, analysis of balanced three phase circuits, and measurement of active and reactive power.
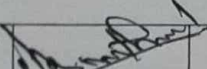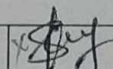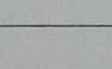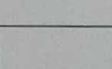
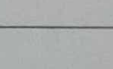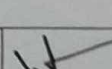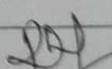**Analysis of three phase unbalanced circuits:**

Loop method, Star-Delta transformation technique, two-wattmeter method for measurement of three phase power.

UNIT – II

Laplace transforms & Transient Analysis – Definition and Laplace transforms of standard functions– Shifting theorem – Transforms of derivatives and integrals, Inverse Laplace transforms and applications,Transient response of series R-L, R-C and R-L-C circuits for D.C. and sinusoidal excitations – Initial conditions - Solution using differential equation approach and Laplace transform approach.

UNIT - III

Network Parameters: Impedance parameters, Admittance parameters, Hybrid parameters, Transmission (ABCD) parameters, conversion of Parameters from one form to other, Conditions for Reciprocity and Symmetry, Interconnection of Two Port networks in Series, Parallel and Cascaded configurations- problems.

Signature								
Name	Dr.B.Muthuvel, Chairman BOS	Dr.N.Sumathi Member	Dr.K.Siva Kumar, Member	Dr.M.Gopichan d NaikMember	Mr.T.Veerababu, Member	Dr.K.Bapayya Naidu,Member	Dr.JVG Ramarao,Mem ber	Prof ANVJ Raja Gopal, Member

UNIT - IV

Analysis of Electric Circuits with Periodic Excitation: Fourier series and evaluation of Fourier coefficients, Trigonometric and complex Fourier series for periodic waveforms, Application to Electrical Systems – Effective value and average value of non-sinusoidal(square) periodic waveforms.

UNIT - V

Filters: Classification of filters-Low pass, High pass, Band pass and Band Elimination filters, Constant-k filters -Low pass and High Pass. Basic design of low pass and high pass filters.
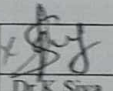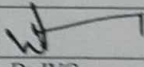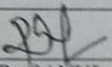
Textbooks:

1. Engineering Circuit Analysis, William Hayt and Jack E. Kemmerly, 9th Edition McGraw-Hill, 2020

2. Fundamentals of Electric Circuits, Charles K. Alexander, Mathew N. O. Sadiku, 7th Edition, Tata McGraw-Hill, 2022

Reference Books:

1. Network Analysis, M. E. Van Valkenburg, 3rd Edition, PHI, 2019.
2. Network Theory, N. C. Jagan and C. Lakshminarayana, 1st Edition, B. S. Publications, 2012.
3. Circuits and Networks Analysis and Synthesis, A. Sudhakar, Shyam Mohan S. Palli, 5th Edition, Tata McGraw-Hill, 2017.
4. Engineering Network Analysis and Filter Design (Including Synthesis of One Port Networks)- Durgesh C. Kulshreshtha Gopal G. Bhise, Prem R. Chadha ,Umesh Publications 2012.
5. Circuit Theory: Analysis and Synthesis, A. Chakrabarti, Dhanpat Rai & Co., 2018, 7th Revised Edition.

Online Learning Resources:

1. https://archive.nptel.ac.in/courses/117/106/117106108/
2. https://archive.nptel.ac.in/courses/108/105/108105159/

Signature								
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