CIRCUITS & SYSTEMS

Paper Code: ETEE 207	**L**	**T/P**	**C**
Paper: Circuits & Systems	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Q. No.1 rest of the paper shall consist of four units as per the syllabus, every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Objective: The purpose of this course is for each student to learn and further explore the techniques of advanced circuit analysis. The concepts and analytical techniques gained in this course (e.g., signals, Laplace transformation, frequency response) will enable students to build an essential foundation of many fields within electrical engineering, such as control theory, analog electronic circuits, signal processing.

UNIT-I

Introduction to signals, their classification and properties, different types of systems, LTI systems and their properties, periodic waveforms and signal synthesis, properties and applications of Laplace transform of complex waveform.

[T1,T2][No. of Hours: 10]

UNIT-II

System modeling in terms of differential equations and transient response of R, L, C, series and parallel circuits for impulse, step, ramp, sinusoidal and exponential signals by classical method and using Laplace transform.

[T1,T2][No. of Hours: 12]

UNIT-III

Graph theory: concept of tree, tie set matrix, cut set matrix and application to solve electric networks.

Two port networks – Introduction of two port parameters and their interconversion, interconnection of two 2-port networks, open circuit and short circuit impedances and ABCD constants, relation between image impedances and short circuit and open circuit impedances. Network functions, their properties and concept of transform impedance, Hurwitz polynomial.

[T1,T2][No. of Hours: 10]

Unit IV

Positive real function and synthesis of LC, RC, RL Networks in Foster's I and II, Cauer's I& II forms, Introduction of passive filter and their classification, frequency response, characteristic impedance of low pass, high pass, Band Pass and Band reject prototype section.

[T1,T2][No. of Hours: 10]

Text Books:

[T1] W H Hayt "Engineering Circuit Analysis" TMH Eighth Edition
[T2] D. R. Choudhary, "Networks and Systems" New Age International, 1999.

Reference Books

[R1] S Salivahanan "Circuit Theory" Vikas Publishing House 1st Edition 2014
[R2] Valkenburg, " Network analysis" PHI, 2000.
[R3] Bhise, Chadda, Kulshreshtha, " Engineering network analysis and filter design" Umesh publication, 2000.
[R4] Kuo, "Network analysis and synthesis" John Weily and Sons, 2nd Edition.
[R5] Allan H Robbins, W.C.Miller "Circuit Analysis theory and Practice"Cengage Learning Pub 5th Edition 2013
[R6] Bell "Electric Circuit" Oxford Publications 7th Edition