

<b>Paper Code(s): EEC-206</b>	<b>L</b>	<b>P</b>	<b>C</b>
<b>Paper: Network Analysis and Synthesis</b>	<b>3</b>	<b>-</b>	<b>3</b>

<b>Marking Scheme:</b>												
1. Teachers Continuous Evaluation: 25 marks												
2. Term end Theory Examinations: 75 marks												
<b>Instructions for paper setter:</b>												
1. There should be 9 questions in the term end examinations question paper.												
2. The first (1 <sup>st</sup> ) question should be compulsory and cover the entire syllabus. This question should be objective, single line answers or short answer type question of total 15 marks.												
3. Apart from question 1 which is compulsory, rest of the paper shall consist of 4 units as per the syllabus. Every unit shall have two questions covering the corresponding unit of the syllabus. However, the student shall be asked to attempt only one of the two questions in the unit. Individual questions may contain upto 5 sub-parts / sub-questions. Each Unit shall have a marks weightage of 15.												
4. The questions are to be framed keeping in view the learning outcomes of the course / paper. The standard / level of the questions to be asked should be at the level of the prescribed textbook.												
5. The requirement of (scientific) calculators / log-tables / data – tables may be specified if required.												
<b>Course Objectives:</b>												
1.	To understand the network theorem in AC circuit.											
2.	To understand mathematical modelling of circuit.											
3.	To understand two port parameter and transfer function.											
4.	To understand realization of passive network and filter.											
<b>Course Outcome (CO):</b>												
CO 1	Ability to apply network theorems in AC circuit.											
CO 2	Ability to determine transient respond of circuit.											
CO 3	Ability to determine two port parameter of circuit.											
CO 4	Ability to realize the circuit from their transfer function.											
<b>Course Outcomes (CO) to Programme Outcomes (PO) Mapping (Scale - 1: Low, 2: medium, 3: High)</b>												
CO/PO	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO 1	3	3	3	3	2	1	1	-	2	1	-	2
CO 2	3	3	3	3	2	1	1	-	2	1	-	2
CO 3	3	3	3	3	2	1	1	-	2	1	-	2
CO 4	3	3	3	3	2	1	1	-	2	1	-	2

**UNIT-I**

Application of Mesh current analysis, Node voltage analysis and Network theorems in AC circuits.  
Graph theory: concept of tree, tie set matrix, cut set matrix and application to solve electric networks.

**UNIT-II**

Periodic waveforms and signal synthesis, properties and applications of Laplace transform of complex waveform.  
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.

**UNIT-III**

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.

Applicable from Batch Admitted In Academic Session 2021-22 Onwards

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**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.

**Textbook(s):**

1. W H Hayt "Engineering Circuit Analysis" TMH Eighth Edition
2. Kuo, "Network analysis and synthesis" John Wiley and Sons, 2nd Edition.

**Reference Books:**

1. S Salivahanan "Circuit Theory" Vikas Publishing House 1st Edition 2014
2. Van Valkenburg, " Network analysis" PHI, 2000.
3. Bhise, Chadda, Kulshreshtha, " Engineering network analysis and filter design" Umesh publication, 2000.
4. D. R. Choudhary, "Networks and Systems" New Age International, 1999
5. Allan H Robbins, W.C.Miller "Circuit Analysis theory and Practice" Cengage Learning Pub 5th Edition 2013
6. Bell "Electric Circuit" Oxford Publications 7th Edition.