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**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**Name of the Faculty**: **Mr. G. Satish Class& Branch**: II B.Tech I Sem ECE-A1,A2,B1

**Subject**: **NETWORK THEORY Academic Year: 2019-20**

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| **S. No** | **Name of the Topic** | **Reference Book** | **Delivery**  **Method** |
|  | **UNIT– I:-**Review of R,L,C and M (Mutual Inductance) | T3(5 to 9) | Chalk & Talk |
|  | V-I characteristics-dot rule | T3(2.21) | Chalk & Talk |
|  | Energy Sources, Ideal, Practical and dependent sources | T3(10) | Chalk & Talk |
|  | Voltage and Current division | T3(11-21) | Chalk & Talk |
|  | problems | -- | Chalk & Talk |
|  | problems | -- | Chalk & Talk |
|  | Source transformation | T3(88-89) | Chalk & Talk |
|  | problems | -- | Chalk & Talk |
|  | problems | -- | Chalk & Talk |
|  | Star Delta transformation | T3(110-113) | Chalk & Talk |
|  | problems | -- | Chalk & Talk |
|  | Mesh Analysis | OT2(76-87) | Chalk & Talk |
|  | Nodal Analysis | OT2(87-99) | Chalk & Talk |
|  | problems | -- | Chalk & Talk |
|  | problems | -- | Chalk & Talk |
|  | **Graph Theory:** Introduction to Graph Theory | T3(47-54) | PPT |
|  | Cut set and loop matrices | T3(54-64) | PPT |
|  | Relationship among various matrices and parameters | T3(54-64) | PPT |
|  | Mesh Analysis for DC circuits. | T3(65-72) | Chalk & Talk |
|  | Nodal Analysis for DC circuits. | T3(78-84) | Chalk & Talk |
|  | Problems | -- | Chalk & Talk |
|  | Formulation of mesh &nodal equations involving are R, L, C and M. | T3(244-255) | Chalk & Talk |
|  | problems | -- | Chalk & Talk |
|  | **UNIT – II:-**Review of sinusoidal analysis | T3(165-243) | PPT |
|  | Phase relation in pure resistor, Inductor and capacitor | T3(165-176) | PPT |
|  | Impedance diagram, phasor diagram | T3(185-188) | PPT |
|  | Series and parallel circuits, compound Circuits | T3(185-215) | Chalk & Talk |
|  | Computation of active, reactive and complex Powers, power factor | T3(221-229) | Chalk & Talk |
|  | First order R-L, R-C circuits | OT1(178-209) | Chalk & Talk |
|  | Initial conditions in RLC elements | OT2(238-263) | Chalk & Talk |
|  | Initial conditions for complicated network time constant | OT2(238-263) | Chalk & Talk |
|  | Second order circuits (RLC series and parallel circuits) | OT2(296-322) | Chalk & Talk |
|  | **UNIT – III:-Laplace Transforms:** | OT2(645-694) | PPT |
|  | Laplace Transforms of typical signals | WEB 2 | Chalk & Talk |
|  | Periodic functions | T3(585-587) | Chalk & Talk |
|  | Inverse transforms | T3(587-593) | Chalk & Talk |
|  | Initial and final value theorems | T3(594-597) | Chalk & Talk |
|  | Application of Laplace transforms in circuit analysis | T3(614-633) | Chalk & Talk |
|  | problems | -- | Chalk & Talk |
|  | problems | -- | Chalk & Talk |
|  | problems | -- | Chalk & Talk |
|  | **Transformed Network Analysis:** | OT1(249-263) | Chalk & Talk |
|  | Response of RL, RC, RLC circuits for impulse and Pulse excitations | OT1(251-255) | Chalk & Talk |
|  | Definition of operational/ transformed impedances and admittances of L | OT1(256-258) | Chalk & Talk |
|  | Definition of operational/ transformed impedances and admittances of C | OT1(256-258) | Chalk & Talk |
|  | Development of transformed networks incorporating initial conditions as sources and solution of transformed networks. | OT1(258-262) | Chalk & Talk |
|  | **UNIT – IV:-Network Theorems:** | T3(110-163) | PPT |
|  | Superposition theorem, | T3(114-119) | PPT |
|  | Thevenin’s and Norton’s theorems | T3(120-126) | Chalk & Talk |
|  | Reciprocity, Compensation | T3(127-130) | Chalk & Talk |
|  | Maximum power transfer theorems | T3(130-132) | Chalk & Talk |
|  | Tellegan’s and Millman’s theorems | T3(135-138) | Chalk & Talk |
|  | Application of theorems to DC circuits | T3(110-163) | Chalk & Talk |
|  | Sinusoidal steady state Mesh and Node Analysis | T3(224-255) | Chalk & Talk |
|  | Application of network theorems to AC circuits | T3(256-265) | Chalk & Talk |
|  | **UNIT - V**  **Resonance:** Series resonance, Impedance and phase angle | T3(284-288) | PPT |
|  | Bandwidth and Q factor | T3(291-294) | PPT |
|  | Its effect on bandwidth, magnification, parallel resonance, resonant frequency | T3(294-301) | Chalk & Talk |
|  | Variation of impedance with frequency | T3(301-302) | Chalk & Talk |
|  | Q factor, magnification, reactance curves in parallel resonance | T3(302-305) | Chalk & Talk |
|  | Frequency response of RL, RC circuits | WEB 3,4 | PPT |
|  | Problems | -- | Chalk & Talk |
|  | Problems | -- | Chalk & Talk |

**LEARNING RESOURCES**

**TEXT BOOKS:**

1. William H. Hayt, Jack E. Kemmerly and Steven M. Durbin, Engineering Circuit Analysis, 6thEdition,TMH, 2002.
2. M.E.Vanvalkenburg, Network Analysis, 3rd Edition, PHI, 2003.
3. A Sudhakar and Shyam Mohan SP, Circuits and Networks: Analysis and Synthesis, 4th  Edition, TMH, 2010
4. Circuits and Networks: Analysis, design and synthesis by M.S.Sukhija and T.K.Nagsarkar, Oxford press, 2010.

**REFERENCE BOOKS:**

1. Franklin F.Kuo, Network Analysis and Synthesis, 2nd Edition, John Wiley & Sons, 2003.
2. Mahmood Nahvi and Joseph Edminister, Electric Circuits, 4th Edition, Schaum’s outline series, TMH, 2004.
3. Theory and problems of Electric Networks by B.R. Gupta.
4. Network analysis and synthesis by F.F. Kuo.

**OTHER TEXT BOOKS:**

**OT1:-** Basic Electrical Engineering, Second Edition, By I. J. Nagrath,Tata McGraw-Hill Education

**OT2:-** Fundamentals of Electric Circuits 4th Edition by Charles K. Alexander (Author), Matthew N.O. Sadiku (Author)

**OT3:-** Basic Electrical Engineering, B.L. Theraja & A.K. Theraja,s. Chand & company ltd.

**WEB REFERENCES:**

1. https://ocw.mit.edu/courses/ Laplace-transform-basics/ intro.pdf
2. http://fourier.eng.hmc.edu/e102/lectures/Laplace\_Transform/node6.html
3. https://ocw.mit.edu/courses/lecture-notes/resonance\_qfactr.pdf
4. https://en.wikipedia.org/wiki/RC\_circuit
5. [www.ece.umd.edu/class/enee204.../LectureNOtes/LectureMain.html](http://www.ece.umd.edu/class/enee204.../LectureNOtes/LectureMain.html)
6. <http://www.ee.washington.edu/faculty/soma/fipse/faculty_guide.pdf>
7. project.mvps.org/networkanalysis.htm % Applications of NA.
8. books.google.com/books/about/Network Analysis.html? id=17IP... %References.
9. www.allaboutcircuits.com › ... › DC NETWORK ANALYSIS % DC network analysis
10. www.microimages.com/documentation/Tutorials/network.pdf % Network analysis tutorials
11. www.robcross.org/network\_tutorials.htm % Network analysis tutorials
12. http://www.nptelvideos.in/2012/11/circuit-theory.html
13. http://elearning.vtu.ac.in/P9/notes/06ES34/Unit1-KCV.pdf

**Signature of the faculty**