OEE751 BASIC CIRCUIT THEORY

DETAILED SYLLABUS

OBJECTIVES:

- To introduce electric circuits and its analysis
- To impart knowledge on solving circuit equations using network theorems
- To introduce the phenomenon of resonance in coupled circuits.
- To introduce Phasor diagrams and analysis of three phase circuits

UNIT I BASIC CIRCUITS ANALYSIS

Resistive elements - Ohm's Law Resistors in series and parallel circuits – Kirchoffs laws – Mesh current and node voltage - methods of analysis.

UNIT II NETWORK REDUCTION AND THEOREMS FOR DC CIRCUITS

Network reduction: voltage and current division, source transformation – star delta conversion. Thevenins and Norton Theorems – Superposition Theorem – Maximum power transfer theorem – Reciprocity Theorem – Millman's theorem.

UNITIII AC CIRCUITS

Introduction to AC circuits, inductance reactance, capacitive reactance, Phasor diagrams, real power, reactive power, apparent power, power factor, R-L R-C , RLC networks, Network reduction: voltage and current division, source transformation –mesh and node analysis, Thevenins and Norton Theorems – Superposition Theorem – Maximum power transfer theorem – Reciprocity Theorem – Millman's theorem.

UNIT IV THREE PHASE CIRCUITS

A.C. circuits – Average and RMS value - Phasor Diagram – Power, Power Factor and Energy.- Analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads,

balanced & un balanced – phasor diagram of voltages and currents – power measurement in three phase circuits.

UNIT V RESONANCE AND COUPLED CIRCUITS

Series and parallel resonance – their frequency response – Quality factor and Bandwidth – Self and mutual inductance – Coefficient of coupling – Tuned circuits – Single tuned circuits.

OUTCOMES:

- Ability to introduce electric circuits and its analysis
- Ability to impart knowledge on solving circuit equations using network theorems
- Ability to introduce the phenomenon of resonance in coupled circuits.
- Ability to introduce Phasor diagrams and analysis of three phase circuits

SSLC, HSE, DIPLOMA, B.E/B.TECH, M.E/M.TECH, MBA, MCA

Notes   *Available @*
Syllabus
Question Papers   www.Binils.com
Results and Many more…

TEXT BOOKS:

1. William H. Hayt Jr, Jack E. Kemmerly and Steven M. Durbin, "Engineering Circuits Analysis", McGraw Hill publishers, edition, New Delhi, 2013.

2. Charles K. Alexander, Mathew N.O. Sadiku, "Fundamentals of Electric Circuits", Second Edition, McGraw Hill, 2013.

3.Allan H. Robbins, Wilhelm C. Miller, "Circuit Analysis Theory and Practice", Cengage Learning India, 2013.

REFERENCES

1. Chakrabarti A, "Circuits Theory (Analysis and synthesis), Dhanpath Rai & Sons, New Delhi, 1999.

2. Jegatheesan, R., "Analysis of Electric Circuits," McGraw Hill, 2015.

3. Joseph A. Edminister, Mahmood Nahri, "Electric circuits", Schaum's series, McGraw- Hill, New Delhi, 2010.

4. M E Van Valkenburg, "Network Analysis",Prentice-Hall of India Pvt Ltd, New Delhi, 2015.

5. Mahadevan, K., Chitra, C., "Electric Circuits Analysis," Prentice-Hall of India Pvt Ltd., New Delhi, 2015.

6. Richard C. Dorf and James A. Svoboda, "Introduction to Electric Circuits", 7th Edition, John Wiley & Sons, Inc. 2015.

7. Sudhakar A and Shyam Mohan SP, "Circuits and Network Analysis and Synthesis", McGraw Hill, 2015.