Electric Circuits & Networks

(Code : 22330)

SECOND YEAR DIPLOMA

Maharashtra State Board of Technical Education (MSBTE)

Semester III – Electronics Engineering, Digital Electronics and Instrumentation Engineering Program Group (DE/EJ/ET/EN/EX/EQ/IE/IS/IC)

Strictly as per new revised 'I' Scheme w.e.f. academic year 2018-2019

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We dedicate this Publication soulfully and wholeheartedly,

in loving memory of our beloved founder director,

Late Shri. Pradeepji Lalchandji Lunawat,

who will always be an inspiration, a positive force and strong support

behind us.

"My work is my prayer to God"

- Lt. Shri. Pradeepji L. Lunawat

Soulful Tribute and Gratitude for all Your Sacrifices, Hardwork and 40 years of Strong Vision…

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Syllabus…

Unit	Topics and Sub-topics
Unit - I : Single Phase A.C. Circuits **Refer chapters 1, 2 and 3**	1.1 Series AC circuits : R-L, R-C and R-L-C circuits, Impedance, Reactance, Phasor diagram, Impedance triangle, Power factor, Active (real) power, Apparent power, Reactive power, Power triangle. 1.2 AC series circuit by using complex algebra. 1.3 Parallel AC circuits, Resistance in parallel with pure inductance, Resistance in parallel with capacitance, Series combination of resistance and inductance in parallel with capacitance. 1.4 Concept of Admittance, Conductance and Susceptance. 1.5 Concept of initial and final conditions in switching circuits, Meaning of t = 0–, t = 0+ and t = ∞, R, L, and C at initial conditions, R, L, and C at final conditions.
Unit - II : Resonance in Series and Parallel Circuits **Refer chapter 4**	2.1 Series and parallel resonance. 2.2 Impedance and phase angle of a series and parallel resonant circuits. 2.3 Voltage and current in a series and parallel resonant circuit. 2.4 Bandwidth of RLC circuit (Series and parallel resonance). 2.5 Quality factor (Q) and its effect on bandwidth (Series and parallel resonance). 2.6 Magnification in series and parallel resonance circuits.
Unit - III : Principles of Circuit Analysis **Refer chapter 5**	3.1 Source transformation. 3.2 Star/delta and delta/star transformations. 3.3 Mesh analysis. 3.4 Node analysis.
Unit - IV : Network Theorems **Refer chapter 6**	4.1 Superposition theorem for both AC voltage and DC source. 4.2 Thevenin's theorem. 4.3 Norton's theorem. 4.4 Maximum power transfer theorem. 4.5 Reciprocity theorem. 4.6 Superposition theorem.

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Unit	Topics and Sub-topics
Unit - V : Two Port Networks **Refer chapter 7**	5.1 Significance of two port network. 5.2 Open circuit (Z) and short circuit (Y) parameters. 5.3 Transmission (ABCD) parameter. 5.4 T and π representation of circuits. 5.5 Reciprocal and symmetrical two port network (No derivation).

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Unit-I

Chapter 1 : Single Phase Series AC Circuits 1-1 to 1-38

Syllabus : Series AC circuits : R-L, R-C and R-L-C circuits, Impedance, Reactance, Phasor diagram, Impedance triangle, Power factor, Active (real) power, Apparent power, Reactive power, Power triangle, AC series circuit by using complex algebra.

Syllabus : Series and parallel resonance, Impedance and phase angle of a series and parallel resonant circuits, Voltage and current in a series and parallel resonant circuit, Bandwidth of RLC circuit (Series and parallel resonance), Quality factor (Q) and its effect on bandwidth (Series and parallel resonance), Magnification in series and parallel resonance circuits.

Unit-IV

Syllabus : Superposition theorem for both AC voltage and DC source. Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Reciprocity theorem, Superposition theorem.

Syllabus : Significance of two port network, Open circuit (Z) and short circuit (Y) parameters, Transmission (ABCD) parameter, T and π representation of circuits, Reciprocal and symmetrical two port network (No derivation).

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