ELECTRONICS PORTIONS

I PUC

4B	**PASSIVE ELECTRONIC COMPONENTS**
	Inductors: Review of laws of electromagnetic Induction **Definitions of self, mutual inductances and unit of Inductance.** **Inductor** - factors determining the inductance of inductor $\left(L = \dfrac{\mu N^2 A}{\ell} \right)$ **Energy stored in an inductor** i.e., $E = \frac{1}{2} LI^2$ (no derivation), **Fixed Inductors:** Air core, iron core, ferrite core - construction and applications. Expressions for series and parallel combination of inductors neglecting the mutual inductance (no derivations).
	Transformers: Principle (mutual induction), Turns ratio, voltage ratio and current ratio - relation between them, step up and step down transformers, Centre tapping in transformers, problems, applications of transformers, Efficiency in transformers
	Transducers: Definition of transducer, pressure transducers - microphone and loud speaker – construction, working and applications,
6B	**SEMICONDUCTORS, DIODES AND APPLICATIONS OF DIODES**
	Filters: Need for filters, series inductor filter, shunt capacitor filter and Inductive input L type filter, - circuit diagram, working and waveforms for each type, bleeder resistance
	Zener diode: schematic symbol, Zener and avalanche breakdown, V-I characteristics of Zener diode, its application in voltage regulation-study of line and load regulation, Calculation of minimum load resistance required for regulation - problems with constant input and variable input voltage.

Design of practical regulated power supplies – Design of a rectifier for a given DC voltage, Fixed positive regulated power supply using 7812, Fixed negative regulated power supply using 7912 and Adjustable regulated power supply using LM317. Specifications of DC regulated power supply.

Special Diodes

Light Emitting Diode (LED) - symbol, construction - type of materials used, working in brief and applications.

Seven segment display: LED display - pin configuration showing the different segments-a, b, c, d, e, f, g and dp. Display of digits 0 to 9.

8A	INTRODUCTION TO DIGITAL ELECTRONICS

Introduction, importance of Digital Electronics, representation of digital and Binary signals, Positive and Negative logic.

Number systems – Need for the study of various number systems, Decimal number system, and Binary number system – advantage, bit, nibble, byte, memory representation using Bytes, hexadecimal number systems, conversion from one system to another. Binary addition, subtraction, multiplication and division, 1's complement, 2's complement, 1's complement and 2's complement method for subtraction of binary numbers (subtraction of a binary number of smaller value from a number of larger value), sign magnitude binary number.

Boolean Algebra: Introduction to Boolean Algebra, Basic Boolean operators (OR, AND and NOT operators), Basic Laws and theorems of Boolean Algebra, De Morgan's theorems and their verification, Boolean identities, Simplification of Boolean expressions,