

ELECTRONICS CURRICULUM

CLASS- XI

PAPER- I

BASIC ELECTRONICS

- 1.) Overview Of Atom and sub-atomic particles
 - Brief History Of Electronics
 - Atom and its elements, Bohr Atomic model, Atomic energy level
 - Electron, Force, Field intensity, Potential, Energy, current, current density, Ionization potential
 - Electric field, Magnetic field, Motion of charged particles in electric and magnetic field
 - Overview of CRO, Electronic and Magnetic deflection in CRO, Applications
- 2.) Voltage and Current
 - Resistance, Ohm's law, V-I Characteristics, Resistors, Capacitors, Inductors
 - Voltage and Current sources, Symbols and Graphical representation, Conversion of current and voltage sources
 - Overview of AC, DC, Cells and Batteries
- 3.) Basics of Semiconductor
 - Semiconductor materials, Energy band structure of Insulators, Metals and Semiconductors, Field and Photo-electric emission.
 - Intrinsic & Extrinsic semiconductor, N-type and P-type semiconductor, Drift current, Diffusion current and Total current, Effects of temperature, Mobility, Conductivity, Energy gap
 - PN junction diode, depletion layer, potential barrier, Forward & Reverse bias, Effects of temperature, Resistance levels, Breakdown in Junction diode, Zener diode, Photo diode, LED, Types and applications of diode
 - Diode as a rectifier, Half wave and full wave rectification, Clippers, Clampers, Voltage multipliers, Filters, Regulators
- 4.) Bipolar Junction Transistor
 - Construction and Biasing of BJT, Operation of NPN and PNP transistors
 - CB, CE and CC configuration, Characteristics and transistor parameters for CB, CE, CC configuration
 - Introduction to FET, JFET, MOSFET, CMOS and VMOS, Characteristics of various transistors, Comparison of various transistors
- 5.) Transistor Amplifier and Applications
 - Introduction, Single and Multi stage amplifiers, Small signal analysis, General amplifier characteristics, Feedbacks in amplifier
 - Introduction to Oscillators, Multi-Vibrators and Signal generator
 - *Special information - (Introduction to Thyristors, PNPN diode, SCR, LASCR, DIAC, TRIAC)
- 6.) Electron Tubes
 - Concept of Electron tubes, Construction, Working, Characteristics
 - Types of Electron tubes

PRACTICAL

- 1.) Study working of Ammeter, Voltmeter and Galvanometer.
- 2.) Study working of Multi-meter, Wattmeter and Energy meter.
- 3.) Study working of Oscilloscope and Signal Generator.
- 4.) Study working of potential divider and explain with example.
- 5.) Study CE, CB, CC configuration for NPN and PNP transistors.
- 6.) Study working of Diode, BJT and FET.
- 7.) Study working of single and double layer PCB manufacturing.
- 8.) Study uses of different transmission lines with demonstration and fault finding.
- 9.) Study uses of different antennas. Also study different installation and measurement of radiation energy.
- 10.) Study uses of different wave guides with demonstration and fault finding.
- 11.) Study various types of modulation kits.

PAPER - II

DIGITAL ELECTRONICS

- 1.) Number Systems and Boolean Algebra
 - Basics of Analog, Digital and Consumer Electronics
 - Number systems: Fixed point, floating point, 1's complement, 2's complement, Binary, Octal and Hexadecimal, conversions and arithmetic operations, BCD, Gray code, Excess 3 code, ASCII codes
 - Boolean algebra, De-morgan's law, Truth tables
- 2.) Logical Circuits
 - Logic gates: Negative logic and positive logic, AND, OR, NOT, NOR, NAND, XOR, XNOR
 - Arithmetic Circuits: Adders and subtractors, Adders cum subtractors, Half adders, Full adders
 - Combinational Circuits: Encoders, Decoders, Multiplexers, De-Multiplexers, Code converters, Comparators
- 3.) Integrated Circuits and Memories
 - Introduction to IC's, Importance and applications, Linear and Digital IC's
 - Introduction to SSI, MSI, LSI and VLSI
 - Memory Organisation and Operations, Classification and Characteristics of memories, RAM, ROM
- 4.) Display Devices
 - LED, LCD, 7 segment display, Common anode and common cathode display
- 5.) Latches and Flip-Flops
 - Concept of Latches, Types of Latches, SR latch
 - SR Flip Flop, JK Flip Flop, D Flip flop, T Flip Flop, Flip Flop as basic memory
 - Introduction to Asynchronous and Synchronous counters, Types of counters
 - Introduction to shift registers, Right shift, Left shift, Bi directional, Universal shift registers
- 6.) Microprocessors and Microcontrollers
 - Block diagram of basic microprocessor system and microcontroller system, Uses of them, difference

PRACTICAL

- 1.) Construction and verification of truth tables for AND, OR, NOT, NAND, NOR, XOR and XNOR logic gates.
- 2.) Construction and verification of operations of half adder and full adder circuits.
- 3.) Construction and verification of positive edge, negative edge and level triggered IC flip flops.
- 4.) Study working of various display devices. (LED, Common anode, Common cathode, 7 segment display)
- 5.) Study and verification of truth tables for Decoder, Encoder, Mux and Demux.
- 6.) Study and verification of truth table for universal shift register.
- 7.) Study the use of asynchronous counter and study dividing by 2, 5, and 10.
- 8.) Study the use of Microprocessors and Microcontrollers.