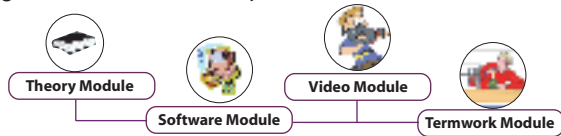


Electronic Materials & Components

Introduces, Global e-Learning System in Education & Training in the form of Learning Resources with Computer Aided Instructions



System Requirement:- IBM-PC Compatible Min P-III with Window-OS, 128 MB RAM/Multimedia Kit

Theory module

Features : Theory, Figures, Photographs, Animations With Controller, Highlighter Tool, Note Creation Facility, Systematic Page Navigation, Printing Facility.

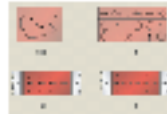
List of Topics

Electronic Materials - I

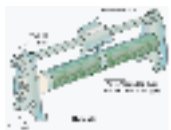
Classifications of Materials, Conducting Materials, Properties & Applications of Copper Aluminium, Gold, Brass, Tungsten, Manganin, Bronze, Phosphor Bronze, Constantan, Nichrome, Carbon & Tin. Insulating Materials, Properties & Application of Mica, Ceramic, Glass, Paper, Rubber, Natural Resins, Synthetic Resins, Thermoplastic Resins, Thermosetting Resins, Dielectric Properties of Insulating Materials (Air, Glass, Paper, Porcelain, Polystyrene) Such as Dielectric Loss, Strength, Dissipation Factor, Charging & Discharging.

Electronic Materials - II

Semiconductor Materials, Properties & Application of Silicon, Germanium, Selenium, Graphite, Silicon Carbide, Gallium Arsenide & Cadmium Sulphide, Magnetic Materials, Principal of Magnetism, B-H Curve, Types of Losses of Ferromagnetic Materials, Soft & Hard Magnetic Materials (General Properties & Applications) Like Pure Iron, CRGO, Nickel Ion Alloy Soft Ferrites, Perm Alloy, Rare Earth Cobalt, Tungsten Steel, Cobalt Steel, Alnico & Hard Ferrites, Comparison of Hysteresis Curves of Soft & Hard Magnetic Materials.



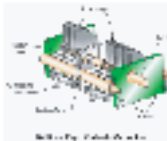
Electronic Passive Components - I



Difference between Active & Passive Components, Fixed Resistors: Colour Coding, Preferred Values E - 12 & E - 24 Series, Study of Properties Like Tolerance Wattage, Temperature Coefficient, Voltage Coefficient, Noise, Operating Temperature Range, Maximum Working Voltage, Power De-rating Curve, Pulse Rating & Skin Effect, Construction, Specifications & Applications of Carbon Composition Resistor, Cracked Carbon Resistor, Metal Film Resistor & Wire Wound Resistor, Study of Wire Wound Resistor Laquare Coating Open, Wound, Ceramic & Aluminum Heat Sink, Vitreous Enameled & Cement Coated Standard Resistor, Variable Resistor, Linear & Logarithmic Potentiometer, Construction, Specification & Applications of Carbon, Wire Wound (Standard Type & Helical Pot) Pots & Rheostat, Trimmers - Rectilinear Rotary (Carbon, Wire Wound & Cermets) Their Construction Specification & Applications, Non-linear Resistors, Thermistor - Bead, Probe, Disc & Rod Type, NTC, PTC, Varistors - Construction & Application, Light Dependent Resistor, Construction & Application, Resistance Network Strips.

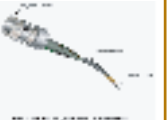
Electronic passive components - II

Fixed Capacitors, Principal of Capacitor, Capacitance Working Voltage, Insulation Resistance C/V Ratio, Power Factor, Capacitance Frequency Characteristics, E.S.R Construction Specification & Applications of Glass, Impregnated Paper, Metallised Paper (With Self Healing Effect), Ceramic Aluminum & Tantalum Capacitor, Variable Capacitor - Straight-line Inverse Square Law & Square Law of Variable Capacitor Plates, Built Up Type & U Frame Type Capacitor, Air Dielectric Gang Condenser, PVC Dielectric Gang Condenser, Trimmer Capacitor, Air dielectric- Rotary, Differential Rotary & Concentric Cylinder Type, Ceramic Rotary, Mica Compression & Plastic Dielectric [Construction, specification & applications of all above types].



Cables, Connectors & Wires

Characteristics of Cables - Characteristic Impedance, Current Carrying Capacity, Flexibility Wires - Cu Wires of Different Gauges, PVC Coverings, Litz Wire Construction & Applications. Cables - Construction & Applications of Coaxial Cable, 600E Telephone Cable, 75E Cable Used for CRO, Signal Generators, Sleeves - Silk, Glass, PTFE & Cotton Connectors, Specifications of Connectors Like Contact Resistance, Breakdown Voltage & Insulation Resistance, Construction & Specifications of - Coaxial Connectors like BNC, TNC & RF, Instrumentation Connectors Like X & XM Plug & Socket, Jones Plug, Modular Plugs With Multipoles, D Series Connectors, Video Connectors, Centronics Printer Connector.



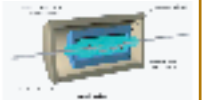
Inductor and Transformer



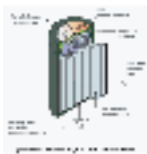
Inductor, Concept, Operation at Low & High Frequency, Self & Mutual Inductance Quality Factor, Inductive Reactance, Leakage Inductance, Construction & applications of : Air Core, Iron core, Ferrite Core, AFC, RFC, Filter Chokes, Transformer, Basics V, I, and Z ratio, Types of Coils - Shell, Core Type Laminations (E, I, L, F & Pot Core), Types of Transformer (With Construction, Specifications & Applications) : Power, Auto, Variable, Audio Frequency, RFT & IFT, Driver, Isolation, Pulse, Current, High voltage (EHT), Losses in Transformer, Shielding of Transformer.

Switches, Relays & displays

Switches: Definitions of Contact Resistance Insulation Resistance, Contact Current Rating, Number of Poles, Electrical, Mechanical Life, Operating Time, Bouncing Construction, Specifications & Applications of - Toggle Switch, Rocker Switch, Rotary, Slide Switch, Micro Switch, DIP, Push Button, Proximity Switch, Membrane Switch, Relays, Definitions of NO, NC Contents, Operate Time, Release Time & Bounce Time, Mechanical & Electrical Life. Constructions, Specifications & Applications of General-Purpose Electromagnetic Relay, Dry Reed Relay, Ferried Relay Solid-State Relays, Display Devices - LED , Nixie Tube, LED Construction, Current & Voltage Rating, Dual Color LED 7-Segment Display LCD - Types, Reflected Light, Twisted Pneumatic Drive, Switching & Two Phase Drive, Voltage & Current Rating, Alphanumeric Display Like Dot Matrix.



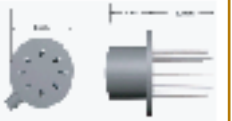
Microphones, Speakers & Batteries



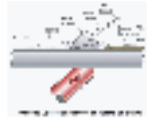
Microphone - Working Principle Types - Carbon, Capacitor, Moving Coil, Crystal, Ribbon (Construction & Applications), Loud speakers - Principle, Types (With Construction & Applications) Cone Type, Horn Type Speakers Woofer, Tweeter & Speaker, Batteries, Cells & Battery Fundamentals, Charging & Discharging Process Difference Between Primary & Secondary Cell, Types of Batteries - Lead Acid Battery - Construction, Open Circuit Voltage Specific Gravity, Discharge, Ampere - Hour Rating, Ni-Cd battery Construction, Specifications, Charging Methods of Above Batteries, Maintenance Free Battery (Introduction).

Integrated Circuits & Surface Mount Devices

Integrated Circuits: Definition, Advantages, Types, (Monolithic, Hybrid, Thick, Thin Film) Process Involved in Manufacturing of Monolithic IC, IC Packages, Surface Mount Devices, Meaning of Surface Mount Technology & SMD, Advantages of SMD, Types- SMD Resistor, SMD Capacitor, SMD Transistor & SMD IC [Description, Specifications, Number Codes] Land Pattern Parameters of SMD Resistors, Capacitors, Transistors & IC's (SOT, PLCC Packages), Assembly of SMD-Soldering Paste, Adhesive & Soldering Technique.



Printed Circuit Boards



Introduction, Advantages, Types of PCB, Cu Clad Laminates & Characteristics (Phenolic & glass epoxy) Manual PCB Design & Fabrication (Single Sided Only) Layout, Artwork, Etching, Drilling & Mounting, Photographic Method of PCB Layout, Scale, Artwork, Materials for Artwork (Tapes, Pads, Puppets, etc) Conductor Width & Current Carrying Capacity for Vcc, Gnd & Signal, Component Assembly, Artwork Methods, Photography, Purpose of Positive, Negative Film, Printing & Etching by Screen-printing & Photoresist Method - Plated Through Holes Process, Drilling Operation. Soldering Techniques, Basics of Soldering, Materials Used & Tools Used, Soft Solder & its Characteristics, Flux & Use, Hand Soldering, Desoldering Pump & Techniques Wave Soldering Process, Safety, Health & Medical Aspects of Soldering, Environmental Testing Meaning, Criteria, Definition of MTBF, MTTF.

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