For GCT, NOWSHERA
LIST OF ELECTRICAL TECHNOLOGY B-TECH (ELECTRICAL)

S.NO.	ITEM NAME	QTY
1	**ELECTRICITY TRAINER along with base unit and modules to perform the following practical:** ➢ DC Voltage Measurement Using an Ohmmeter ➢ Resistor Characteristics ➢ Resistor measurement ➢ Ohm's law ➢ AC voltage/current measurement ➢ Series/parallel circuit ➢ Wheatstone bridge ➢ Kirchoff's law ➢ Thevenin's theorem ➢ Norton's theorem ➢ Maximum power transfer theorem and others ➢ DC RC and RL transient phenomena ➢ AC current/voltage experiment ➢ AC RLC series/parallel circuit ➢ Resonant circuit ➢ Power in AC circuit ➢ DC Current Measurement ➢ Series-Parallel Network and Kirchoff's Law ➢ DC RC Circuit and Transient Phenomena ➢ AC Voltage Measurement ➢ AC Current Measurement ➢ AC, RC Circuit ➢ AC, RL Circuit ➢ AC, RLC Circuit ➢ Power in AC Circuit ➢ Series-Resonant Circuit ➢ Parallel-Resonant Circuit ➢ LC Filter ➢ Magnetic Devices ➢ Magnetic Field ➢ Drawing Magnetic Curves ➢ Magnetic Field Strength ➢ Lenz's and Faraday's Laws ➢ Ampere's Rule ➢ Fleming's Rule ➢ Self-Induction ➢ Mutual Induction ➢ Magnetic Flux Detection	02
2	**Electronics Trainer along with base unit and modules to perform the following Practicals:** ➢ Wheat stone Bridge ➢ Dimmer Circuit ➢ Multistage Cascading Amplifier ➢ Relay Characteristics ➢ Touch-Controlled Switch ➢ Silicon Diode ➢ Germanium Diode ➢ Zener Diode ➢ Light Emitting Diode ➢ Optical Diode ➢ Clipping and Clamping Circuits with Diodes ➢ Clipping Circuit ➢ Clamping Circuit ➢ Rectifier Circuits	**02**

	➢ Half Wave Rectifier Circuit ➢ Full Wave Rectifier Circuit ➢ Bridge Rectifier Circuit ➢ Filter circuits (All types) ➢ Dual Power Supply Rectifier Circuit ➢ Voltage Magnified Rectifier Circuit ➢ Transistors ➢ PNP Transistor ➢ NPN Transistor ➢ Transistor Amplification Circuits ➢ Common Emitter Transistor Amplification Circuit ➢ Common Base Transistor Amplification Circuit ➢ Common Collector Transistor Amplification Circuit ➢ Switching Type Transistor Circuit ➢ Darlington's Circuit ➢ Field Effect Transistors (FET) ➢ Junction Type FET (JFET) ➢ Metal-Oxide-Semiconductor FET (MOSFET) ➢ DE & E-MOSFET ➢ OP Amplifiers ➢ Transistor Differential Amplification Circuit ➢ Characteristics of OP Amplifiers ✓ Input Impedance Measurement ✓ Output Impedance Measurement ✓ Bandwidth Measurement ✓ Slew Rate Measurement ✓ Offset Voltage Measurement ➢ Basic Characteristics of OP Amplifier ➢ Inverse Amplification ➢ Non-Inverse Amplification ➢ Voltage-Follower Circuit ➢ Different Amplification ➢ Sum Amplification (Adder) ➢ Clipping Circuit ➢ Constant Voltage Circuit ➢ Differentiator Circuit ➢ Integrator Circuit	
3	**Power electronics trainer along with base unit and modules to perform the following Practicals** ➢ **UJT Experiments** ✓ UJT Characteristic ✓ UJT Equivalent Circuit ✓ PUT Experiments ✓ PUT Characteristic & Equivalent Circuit ✓ PUT Characteristic ✓ PUT Equivalent Circuit ✓ PUT & SCR Experiments ✓ PUT Staircase Generator & Voltage Control Ramp Circuit ✓ PUT Staircase Generator Circuit ✓ PUT Voltage Control Ramp Circuit SCR Characteristic & RC Shift Control Circuit SCR Characteristic Curve SCR RC Phase Control Circuit ➢ **SCS Experiment** ✓ SCS Characteristic Experiment ✓ SCS Schmitt Circuit ✓ SCS Simulate PUT Circuit ✓ SCS Trigger Circuit Experiment	02

	✓ UJT & PUT Trigger SCR Experiments ✓ UJT Trigger SCR Phase Control Circuit ✓ Phase Control Basic Circuit ✓ AC Phase Control Circuit ✓ SCR Control DC Motor & DIAC, TRIAC ✓ Characteristic Experiments SCR Control DC Motor Forward/Reverse Experiment ✓ SCR Cut-Off Principal ✓ SCR Control DC Motor Forward/Reverse Control Experiment ➢ **DIAC, TRIAC Characteristic Experiment** ✓ DIAC Characteristic ✓ DIAC Operation Mode and Measurement ✓ TRIAC Characteristic ✓ TRIAC Trigger Mode ✓ TRIAC Static Measurement ✓ Automatic Control Lamp, TRIAC Control Speed Experiments ✓ Automatic Control Lamp Experiment ✓ TRIAC Shift Control ✓ TRIAC Automatic Control Lamp Experiment ✓ TRIAC Control Motor Speed Experiment ✓ TRIAC Control Motor Speed ✓ Photo-Couple & Touch Control Experiment ✓ Photo-Couple Control Circuit ✓ Semi and Full converters circuits ✓ AC to AC converters as AC Motor speed controller ✓ DC to DC converters ✓ PWM technique of frequency control ✓ Working as Cyclo-converter ✓ Inverters related experiments ➢ **SCR Rectifier Circuit Experiment** ✓ Single-Phase Half-Wave Rectifier ✓ Single-Phase Full-Wave Rectifier ✓ Single-Phase Bridge's Rectifier ✓ Single-Phase half-wave & Full-wave controlled rectifier with Resistive & Inductive load ✓ Three-Phase half-wave and Full-wave controlled rectifier with Resistive and Inductive load ✓ Three-Phase Half-Wave Rectifier ✓ Three-Phase Full-Wave Rectifier ✓ Three phase full-wave control circuits for DC Motors ✓ JFET/MOSFET Characteristic & MOSFET ✓ JFET Characteristic Experiment ✓ MOSFET Characteristic Experiment ➢ **IGBT Characteristic**	
4	**Digital logic trainer along with base unit and modules to perform the following Practicals** ➢ **Threshold Voltage Measurement** ✓ TTL Threshold Voltage Measurement ✓ CMOS Threshold Voltage Measurement ➢ Voltage/Circuit Measurement ✓ TTL/IO Voltage/Current Measurement ✓ CMOS Voltage/Current Measurement ➢ **Measurement of Basic Logic Gates Characteristics** ✓ AND Gate Characteristics Measurement ✓ OR Gate Characteristics Measurement ✓ INVERTER Gate Characteristics Measurement ✓ NAND Gate Characteristics Measurement ✓ NOR Gate Characteristics Measurement ✓ XOR Gate Characteristics ➢ **Measurement Interface Between Logic Gates** ✓ TTL to COMS interface ✓ CMOS TTL interface	02

- NOR Gate Circuit
  NAND Gate Circuit
  XOR Gate Circuit
  - ✓ Constructing XOR Gate with NAND Gate
  - ✓ Constructing XOR Gate with Basic Gate AND-OR-INVERT (AOI) Gate Circuit
- **Comparator Circuit**
  - ✓ Comparator Constructed with Basic Logic Gates
  - ✓ Comparator Constructed with TTL IC chmitt Gate Circuit
- **Open-Collector Gate Circuits**

a. High Voltage/ CIRCUITS
b. Constructing an AND Gate with Open-Collector Gate
c. Bidirectional Transmission Circuit

- **Half-Adder and Full-Adder Circuits**a. Constructing HA with Basic Logic Gates
  b. Full Adder Circuit

c. High-Speed Adder Carry Generator Circuit
d. BCD Code Adder Circuit

- **Half-Subtractor and Full-Subtractor Circuit**

a. Subtractor Circuit Constructed with Basic Logic Gates
b. Full Adder and Inverter Circuit

- **Arithmetic Logic Unit (ALU) Circuit**

Bit Parity Generator Circuit
a. Bit Parity Generator Constructed with XOR Gates
b. Bit Parity Generator IC
Encoder Circuit
a. Constructing a 4-to-2 Encoder with Basic Gates
b. Constructing a 10-to-4 Encoder with TTL IC
Decoder Circuit
a. Constructing a 2-to-4 Decoder with Basic Gates
b. Constructing a 4-to-10 Decoder with TTL IC
Multiplexer Circuit
a. Constructing a 2-to-1 Multiplexer
b. Using Multiplexers to Create Functions
c. Constructing a 8-to-1 Multiplexer with TTL IC
Demultiplexer Circuit
a. Constructing a 2-output Demultiplexer
b. Constructing a 8-output Demultiplexer
Digitally Controlled Analog
Multiplexer/Demultiplexer Circuit
a. analog Switch Characteristics
b. Bidirectional Transmission with CMOS IC Analog Switches
Constructing Oscillator Circuit with Basic Logic Gates
Constructing Oscillator Circuit with Schmitt Gate
Voltage Controlled Oscillator (VCO) Circuit
555 IC Oscillator Circuit
a. 555 Oscillator Circuit
b. VCO Circuit
Monstable Multivibrator Circuits
a. Low-Speed Monostable Multivibrator Circuits
b. High-Speed Monostable Multivibrator Circuits
c. Constructing Monostable Multivibrator Circuits
d. Constructing Non-Retriggerable Circuit with TTL-IC
e. Constructing Retriggerable Circuit with TTL-IC
f. Variable Duty Cycle Oscillator Circuit with
Sequential Logic Circuit Experiments
Flip-Flop Circuits

	a. Constructing a R-S Flip-Flop with a Basic Logic Gates b. Constructing a D Flip-Flop with a R-S Flip-Flop c. Constructing a T Flip-Flop with a D Flip-Flop d. Constructing a J-K Flip-Flop with a R-S Flip-Flop e. Constructing a Shift Register with a d Flip-Flop f. Preset Left/Right Shift Register g. Constructing a Noise Elimination Circuit with R-S Flip-Flop J-K Flip-Flop Circuits a. Asynchronous Binary Up-Counter b. Asynchronous Decade Up-Counter c. Asynchronous divide-by-N Up-Counter d. Asynchronous Binary Down-Counter e. Synchronous Binary Up-Counter f. Synchronous Binary Up/Down Counter g. Preset-able Synchronous Decimal Up/Down Counter h. Preset-able Synchronous Decimal Up/Down Counter **Memory Circuit Experiments** Constructing READ ONLY MEMORY (ROM) with Diodes ERASABLE PROGRAMMABLE READ ONLY MEMORY (EPROM) CIRUIT Electronic EPROM (EEPROM) Circuit **Converter Circuit Experiment** Digital/Analog Converter (DAC) Circuit a. Unipolar DAC Circuit b. Bipolar DAC Circuit Analog/Digital Converter Circuit (ADC) Circuit a. 8-bit Converter Circuit	
5	**Microprocessor 8086/8088 Trainer with computer interface along with computer** • Read and Write Cycles • CPU Initialization • Memory Control Signals, Address Decoding, Data Transfers • Ports: DAC and ADC Ports, PPI and Keypad Interface, Display and Serial Ports • Non-maskable and Maskable Interrupts, Exceptions • Immediate, Register and Memory Addressing Modes • Instruction Formats and Using the 8086 CPU Instructions • Stepper Motor Control and Temperature Control application • Computer specification must be provided **(Along with all standard accessories mention in the brochure and instructional manual and Student manual)**	02
6	**DIGITAL IC TESTER** Features & Device Supports • Tests a wide range of Digital IC's such as 74 Series, 40/45 Series of CMOS IC's. • It has Auto search facility of IC's. • ZIF: 40 pin DIP ZIF sockets. Supply Input Voltage: 230V AC.	04
7	**Dual oscilloscope analog (40mhz)** 40MHz Bandwidth, Dual Channel High sensitivity 1mV/div ALT Triggering Function TV synchronization Z Axis input with all standard accessories	04
8	**Digital storage oscilloscope** 100 MHz Bandwidth with 2 Input Channels with color display. **(With all accessories mention in the brochure and instructional manual)**	04
9	**Digital Function Generator** 20MHz, Sine, Square, Ramp, Noise waveform Amplitude, DC Offset and other key setting information shown on the 5~8 digit display **(With all accessories mention in the brochure and instructional manual)**	04

10	**Digital Multimeter with dual measurement displays (Bench Type)** DC Voltage :100 mV ~ 1000V DC Current: 100µA ~ 10A Resistance : 100Ω ~ 100 MΩ AC Voltage: 100mV ~ 750V AC Current: 100mA ~ 10A Power Source: 230 V **(With all accessories mention in the brochure and instructional manual)**	06
11	**Digital Multimeter (Hand Held)** DC Voltage : 0~1000 V DC Current: 0~10A Resistance : 0~20 MΩ AC Voltage: 0~600 V AC Current: 0~10 A **(With all accessories mention in the brochure and instructional manual)**	06
12	**Intelligent / frequency counter** Frequency and Period Measurement High Resolution at Both High and Low Frequency 0.01Hz~2.7GHz Frequency Range With all standard accessories	02
13	**Techometer (optical type)** With all standard accessories	02
14	**Current transformers** 10VA Demonstration type • Input: 30amp • Out-put 5amp (MULTI TURNS MULTI RATIO)	04
15	**Potential transformers** 10va Demonstration type • Input: 500Vac • Out-put 100Vac (MULTI TURNS MULTI RATIO)	04
16	**Frequency meter** Demonstration type 0-50, 0-100, 0-200, 0-500, Hz	04
17	**Wheat stone bridge, kelvin double bridge, Schering bridge** **Can measure a lot range of** Resistances from milli Ohms to Mega Ohms Capacitances from nano farad to Farads Inductances from milli henries to henries Built in power supply, mains 230V AC (that can measure Resistance, Inductance & Capacitance)	02 each
18	**Maximum demand indicator** Burden 5amp, 500vac. Calibrated at 50 or 60 Hz	06
19	**Watt meters** Demonstration type Multi range up to 3 KW or above in 3 or more equal ranges	06
20	**Volt meters** Demonstration type Multi range up to 1 KV or more in 3 or more equal range	06
21	**Ampere meter** Demonstration type Multi range up to 10amp or more in 3 or more equal range	06
22	**Power factor meter (analog)** Demonstration type Capable of measuring Power Factor of Single and Three Phase	03
23	**Power factor meter (Digital)**	03

	Capable of measuring Power Factor of Single and Three Phase	
24	**Flux meter**	06
25	**Lux meter** Multi range up to 20000 LUX	03
26	**Capacitance decade box** **(1000 pF to 1000 µF and above)**	06
27	**INDUCTANCE decade box** **(0.01 mH to 1 H and above)**	06
28	**Resistance decade box** **(100 Ω to 100 k Ω and above)**	06
29	**Switching DC power supply** Three independent, isolated output CH3 adjustable output : 5V/3A 0-30V x 2, 0-3A x 2 * 2 Independent Isolated Output * Four "3 Digits" LED Displays * 0.01% Load and Line Regulation * Low Ripple and Noise * Tracking Operation and Auto Series/Parallel Operation * Output ON/OFF Switch Over Load and Reverse Polarity Protection **(With all accessories mention in the brochure and instructional manual)**	04
30	**High Precision LCR Meter** 12Hz~100kHz 0.05~0.1% Measurement Accuracy R/Q,C/D, C/R,L/Q test modes for all models Z/Ø, L/R Absolute Value, Δ value, and Δ % Measurement Display LCD Display Computer Interface: with all standard accessories	04
31	**HAND HELD LCR METER** Dual display Test Frequency: 100Hz ~ 10kHz Measurement Parameters: L,C,R,(AC/DC) D,Q,θ Data Hold and Zero Mode Supported Auto Range, Auto Backlit Low Battery Indication Auto Power off with all standard accessories	04
32	**AC milli-Volt Meter analog and digital** (100uV~1V) With all standard accessories	02 Each
33	**DC milli-Volt Meter analog and digital** (100uV~1V) With all standard accessories	02 Each
34	**AC milli-Amp Meter analog and digital** (100uA~1A) With all standard accessories	02 Each
35	**DC milli-Amp Meter analog and digital** (100uA~1A) With all standard accessories	02 Each
36	**Semiconductor curve tracer** Collector Drain Sweep Voltage • Frequency 120Hz or 100Hz • Voltage,5, 10, 20, 30, 40, 50, 60, 80, 100,150 and 200V accuracy ±10% (or continuously variable) • Sweep waveform Full wave rectified	02

	• Current 500mA maximum Step Generator • Current per step 10, 20, 50µA; 0.1, 0.2, 0.5, 1.0, 2.0 mA; accuracy ±5% • Voltage per step 0.1, 0.2, 0.5V; accuracy ±5% • External bias one curve display Polarity Switch • Three modes of operation - NPN, PNP, DIODE. with all standard accessories	
37	**Moving iron (attraction & repulsion type)** **Demonstration type** Volt meter	02 Each
38	**Moving iron (attraction & repulsion type)** **Demonstration type** Ampere meter	02 Each
39	**Permanent magnet instrument** **Demonstration type** Both, Volt-meter and Ammeter	03
40	**Megger: 1000V/1000M.ohm** Hand operated	03
41	**Analog and Digital Earth tester (complete set)**	01 Each
42	**Clamp on meter** 600A AC /DC Clamp On Meter Display: Function keys: Max/Min Hold Test Range: ACV, ACA, DCV, DCA, Ω, Frequency, Watt, reactive power, Power factor with all standard accessories	03
43	**A.V.O/ multi meters** Analog & Digital Type (2 in 1) AC (V)= 0.005V~ 600 V, DC (V) = 0.005V~ 1000 V, R= 1 – 20 MΩ or Above AC =0.01A – 10A DC =0.01A – 10A	04
44	**Multimedia projector** 3000 or above Lumens	01
45	**Digital light meter** **(lux meter)** •LCD Display • Low battery indication. FUNCTIONS • Testing range: 0~200, 2000, 20000 LUX. • Function Keys: Data hold. ACCESSORIES • User's manual • Carrying case	06

For GCT, NOWSHERA
Electrical Machines B-Tech

S.NO	ITEM NAME/ SPECIFICATIONS/ DESCRIPTION	Qty
2	**DISSECTABLE MACHINES** **PRACTICAL COVERAGE** Equipment Familiarization Assembly of the following machines: » Direct Current Machine » Split-Phase Capacitor-Start Motor » Capacitor-Run Motor » Universal Motor » Three-Phase Wound-Rotor Induction Motor » Three-Phase Squirrel Cage Induction Motor » Synchronous Machine » Synchronous Reluctance Motor » Two-Speed Variable-Torque Motor » Two-Speed Constant-Torque Motor	**01**
4	**DIGITAL SERVO TRAINING SYSTEM** **PRACTICAL COVERAGE** Digital Servo » Equipment and Software Familiarization » Open-Loop Servo Motor Static Characteristics » Open-Loop Servo Motor Transient Characteristics » Servo Motor Closed-Loop Speed Control – Steady State Characteristics » Servo Motor Closed-Loop Speed Control – Transient Characteristics and Disturbances » Linear Position Sensing » Linear Position Control » Following Error in Linear Position Control	**01**

For GCT, NOWSHERA
ELECTRICAL COMMUNICATION TECHNOLOGY B-TECH

S.NO	ITEM NAME	QTY
1	**ANALOG COMMUNICATION SYSTEM TRAINER** **Should perform following Experiments:** **(PRACTICAL COVERAGE** • Analog Communications Concepts • Circuit Board Familiarization • Amplitude Modulation (AM) • RF Power Amplifier • Balanced Modulator • RF Stage • Mixer, IF Filter, and Envelope Detector • Balanced Modulator and LSB Filter • Mixer and RF Power Amplifier • RF Stage, Mixer, and IF Filter • Product Detector and Automatic Gain Control • Frequency Modulation (FM) and Phase Modulation (PM) • Demodulation (Quadrature Detector) • PLL (Phased-Locked Loop) Circuit and Operation • FM Detection with a PLL	**1**
2	**Digital Communications Trainer** • Pulse Modulation and Sampling (PAM / PWM / PPM) - Pulse Amplitude Modulation (PAM) - Pulse-Time Modulation (PWM / PPM) Digital Modulation (PCM / DPCM / Delta) - Analog-to-Digital and Digital-to-Analog Conversion - Distortion and Quantization Noise - Pulse Code Modulation (PCM) - Differential Pulse Code Modulation (DPCM) - Delta Modulation (DM) • Basic Modems and Data Transmission (ASK / FSK / BPSK) - Base band Data Transmission - Amplitude-Shift Keying (ASK) - Frequency-Shift Keying (FSK) - Binary Phase-Shift Keying (BPSK) Quadrature Phase Shift Keying (QPSK / DQPSK) - QPSK Modulation - QPSK Demodulation - Differential QPSK (DQPSK) - Data Scrambling and Descrambling Quadrature Amplitude Modulation (QAM / DQAM) - QAM Modulation - QAM Demodulation - Encoding and Decoding - Data Scrambling and Descrambling • Concepts of Digital Communications, Circuit Board Familiarization • PAM Signal Generation, Demodulation, PAM TDM Transmission and Reception • PTM Signal Demodulation and Generation • PCM Signal Generation and Demodulation, Signal Time-Division Multiplexing • DM Transmitter, Receiver and Noise • Channel Bandwidth and Noise	**01**
4	**SATELLITE COMMUNICATIONS TRAINING SYSTEM** **Should perform following Experiments:** • Satellite Communication Fundamentals • Analog Transmission	**01**

	• Digital Transmission • Link Characteristics and Performance • Satellite Orbits, Coverage, and Antenna Alignment With All Standard Accessories	
6	**AM/FM TRANSMITTER & RECEIVER SYSTEM TRAINER** **Should perform following experiments** AM transmitter & Receiver related FM transmitter & Receiver related Modules have switched fault DIP switches for fault-finding experiments **Should consists of following modules** • AM Transmitter • AM Receiver • FM Transmitter • FM Receiver • Power Supply With All Standard Accessories	**2**
7	**FIBER-OPTIC TRANSMISSION TRAINING SYSTEM** **Should perform following Experiments** • Characteristic of fiber optics experiment • Applications of fiber optics experiment • Light sources of fiber optics • Light and fiber optics interaction experiment • Fiber optic transmitters experiment • Receivers for fiber optic system experiment • Fiber optic expand and network experiment • Fiber optic connectors and lose-polishing experiment • Fiber optical data-transmission-self-transceiver experiment • Fiber optical data-transmission-double-transceiver experiment • Fiber optical data-transmission - PC to PC experiment With All Standard Accessories	**2**
8	**MICROWAVE TRAINER** Gunn Oscillator base system Director Coupler & Horn Antenna Frequency: (X Band) Microwave output: **Should perform following Experiments:** The Gunn Oscillator Square law characteristics of Microwave Crystal Detector Frequency Wavelength and Phase Velocity Measurement Q and Bandwidth Measurement in Cavity Resonator Power measurement and Associated Errors Measurement of Impedance Measurement of Standing Wave Ratio (SWR) Attenuation Measurements Directional Coupler's Basic Properties Study of a waveguide Hybrid-T **Should include:** Power meter SWR Meter With All Standard Accessories	**2**
9	**COMPUTER-ASSISTED MICROWAVE TECHNOLOGY TRAINING SYSTEM** **PRACTICAL COVERAGE** • Microwave Fundamentals: principles of microwave signals and their propagation; the construction and operation of microwave components; the techniques used to measure power attenuation, SWR, and impedance.	**2**

	• Microwave Tees, PIN Diodes and Applications: construction and operation of PIN diodes and hybrid tees, and how they are used in microwave applications. Wireless video transmission demonstration. • Microwave Variable-Frequency Measurements and Applications. Construction and operation of variable-frequency oscillators (VCO's). Demonstration of three methods of measuring the frequency of microwave signals. Frequency modulation and demodulation of microwave signals.	
10	POWER TRANSMISSION SMART GRID TECHNOLOGIES TRAINING SYSTEM ***Practical Coverage for Experiments*** • Voltage Regulation Characteristics • Voltage Compensation • Power Transmission Capacity • Voltage Compensation in Long AC Transmission Lines • Control of Active and Reactive Power Flow • Voltage Regulation and Displacement Power Factor (DPF) in Thyristor Three-Phase Bridges • Basic Operation of HVDC Transmission Systems • DC Current Regulation and Power Flow Control in HVDC Transmission Systems • Commutation Failure at the Inverter Bridge • Harmonic Reduction using Thyristor Pulse Converters • Main Components of a Static Var Compensator (SVC) • Voltage Compensation of AC Transmission Lines using an SVC • Dynamic Power Factor Correction Using an SVC • Voltage compensation of AC transmission lines • Dynamic Power Factor Correction	1
11	**UNIVERSAL IC PROGRAMMER** Can program the various IC's including latest & Micro controller etc.	06

12	**Sensor and Transducer Trainer**
	Introduction to Transducers and the Circuit Board
	• Temperature Measurement, Control, RTD, Thermocouple
	• Capacitance Sensor, Touch and Position Sensing
	• Strain Gauge Characteristics
	• Bending Beam Load Cell (Strain Gauge)
	• Ultrasonic Principles, Distance Measurement
	• Infrared Transmission/Reception, IR Remote Control
	• Force Measurement
	• Computerized Temperature Control and Measurement
	  • Control Panels
	  • Plunger Switches
	  • Magnetic Proximity Sensors
	  • Shock/Vibration Sensors
	  • Electronic Active Sensors
	  • Electronic Passive Sensors
	(Along with all standard accessories mention in the brochure and instructional manual and Student manual)
		2

13	**PLC Trainer** DC output: Voltage: 0 – 24V Current: 0 – 2A Ac Output: Voltage: 220V Current: 1 Amp Input/output terminals is 32 or above Memory: 32K or above Internal memory: 2K	2

	Timer/counter: 128/64 Base Module: Din Rail Power supply module: input:120/230 V (AC) Output: 24 V DC/5 A PC interface: USB or Ethernet With software supported (LAD, FBD, and STL). Accessories: Connection cords, PC cable, ac power cord, Program CD, Manual. PLC Application Modules: • Traffic Lights • Electro-Pneumatics • Electro-Mechanical – DC Motor • Electro-Mechanical – Stepper Motor • Level Process Control	
14	**Digital spectrum analyzer** Frequency Range: 9kHz ~3GHz **(With all Accessories mentioned in the brochure and instructional manual)**	3
15	**Digital RF Signal Generator** **Frequency Range: 1 GHz** **(With all Accessories mentioned in the brochure and instructional manual)**	4
16	**Digital Function Generator** 20MHz, Sine, Square, Ramp, Noise waveform Amplitude, DC Offset and other key setting information shown on the 5~8 digit display **(With all accessories mention in the brochure and instructional manual)**	4
17	**FM/AM STANDARD SIGNAL GENERATOR** Frequency Range 100kHz ~ 110MHz	4
18	**Switching DC power supply** Three independent, isolated output CH3 adjustable output : 5V/3A 0-30V x 2, 0-3A x 2 * 2 Independent Isolated Output * Four "3 Digits" LED Displays * 0.01% Load and Line Regulation * Low Ripple and Noise * Tracking Operation and Auto Series/Parallel Operation * Output ON/OFF Switch Over Load and Reverse Polarity Protection **(With all accessories mention in the brochure and instructional manual)**	6
19	**Digital Multimeter with dual measurement displays (Bench Type)** DC Voltage :100 mV ~ 1000V DC Current: 100µA ~ 10A Resistance : 100Ω ~ 100 MΩ AC Voltage: 100mV ~ 750V AC Current: 100mA ~ 10A Power Source: 230 V **(With all accessories mention in the brochure and instructional manual)**	6
20	**Digital Clamp on Meter** AC Amp: 0~200A AC Vtg: 600V DC Vtg: 600V Ohms: 20MΩ **(With all accessories mention in the brochure and instructional manual)**	6
24	**Single and 3-phase Transformer Trainer:** ➢ Input single phase: 220~260vac, 2amp ➢ Input 3 phase: Phase ~ phase 380 ~ 440vac, 2amp (phase ~ neutral) ➢ Output single phase: 80%, 90%, 100%, and 110% ➢ Output 3 phase: 80%, 90%, 100%, and 110%. • Distribution Transformer • Single-Phase Transformers Supplying Single-Phase Loads	4

	• Single-Phase Paralleling • 3-Phase Paralleling • Efficiency calculation of each transformer • Open/no load test • Load/Short circuit • Polarity test Three-Phase Banking of Single-Phase Transformers	
25	**Motor and Transformer Winding Trainer:** • Equipment Familiarization • Split-Phase Capacitor-Start Motor • Three-Phase Squirrel Cage Induction Motor • DC compound motor • Motor Winding machine with counter • Coil winding range up-to 8 inch • All motors should be without winding **(With complete accessories and instruction manual)**	2
26	**DES TESTER OR TRANSFORMER OIL TESTER** Up to 40 KV or more with its operating manual & should be of digital type.	2
27	**D.C. & A.C.** **HI-POT FOR INSULATOR & TRANSFORMER OIL TESTING** 80 KV (AC & DC) with its operating manual & should be of digital type.	2
28	**CAPACITANCE & DISSIPATION FACTOR TESTER** For checking Transformer oil Purity & for Insulation Power Factor.	2
29	**INSULATION TESTER (MEGGER)** Up to 10 KV (Digital Type)	3
30	**RELAY TESTING SET** For all type of latest relay testing along With laptop	1
31	**WATT OUR METER** Single & Three Phase, also Analog & Digital	2 each
32	**KVAR METER** Single & Three Phase, also Analog and Digital	2 Each
33	**SCHERING BRIDGES** Capable of measuring wide range of Capacitance & Inductance use in Daily as well as Small Industry.	2
36	**PROFESSIONAL ELECTRICAL / ELECTRONIC TOOLKIT FOR ENGINEERS** Consist of all types of necessary tools for Trouble shooting etc, such as; Pliers, Soldering gun, Screwdriver set, Multimeter, wire stripper, de-soldering pump, twizers etc	6
37	**11.5 KV TROLLY WITH V.C.B.** For controlling 11.5 KV (use to control whole feeder at Primary Distribution side)	1
38	**EHV CIRCUIT BREAKER MODEL (HYDRAULIC TYPE)** This model should shows each and every part of EHV C.B.	1
39	**CIRCUIT BREAKER RESISTANCE TESTER** For checking contact resistance of Circuit Breaker	1
40	**CIRCUIT BREAKER (OPEN & CLOSED) TIMING TESTING SET** For measuring Opening & Closing time of Circuit breaker contacts	