

COMPARATIVE STATEMENT FOR PROJECT: 193198- INTRODUCTION OF NEW TECHNOLOGIES IN EXISTING TECHNICAL INSTITUTES OF TRIBAL DISTRICTS
LIST OF EQUIPMENT'S FOR ELECTRICAL TECHNOLOGY (GPI JALAKAMELA)
DATE OF TENDER OPENING 09-03-2022
ELECTRICAL TECHNOLOGY

Item No.	Name of Items	Electrical Engineering Service:						
		C.S		P.C		P.L.P		T
		40	5	5	2	4	4	60
1	<p>DC Fundamental trainer along with module and base unit to perform following topics :</p> <ul style="list-style-type: none"> • Circuit Voltage, Current, Resistance • DC Power Sources in Series and in Parallel Series • Opposing DC Sources • Switches Identification and Switching Concepts • Ohm's Law: Circuit Resistance, Current, & Voltage • Resistance, Voltage and Current in a Series Resistive Circuit • Resistance, Voltage and Current in a Parallel Resistive Circuit • Resistance, Voltage and Current in a Series-Parallel Resistive Circuit • Power in a Series and/or Parallel Resistive Circuit • Rheostat and Potentiometer • Voltage and/or Current Dividers • Measuring: DC Ammeter, DC Ohmmeter, DC Voltmeter • Currents and Node Currents in a Two-Element Branch Circuit • Voltages in a Three-Element Series Circuit • Algebraic Sum of Voltages in a Series Circuit • Generating Loop Equations and Node Equations • Kirchoff's Voltage and Current Laws with a Two-Source Circuit • Mesh Solutions, Superposition Solution and Millman's Theorem Solution of a Two-Source Circuit • Thevenizing a Single-Source Network and a Dual-Source Network • Thevenin Resistance (RTH) and Voltage (VTH) of a Bridge Circuit • Thevenin-to-Norton Conversion • Norton-to-Thevenin Conversion • Tee and Wye or Pi and Delta Networks • Transformation of Delta and Wye Networks • Troubleshooting Basics and DC Networks <p>(With complete accessories and instruction manual)</p>	40	0	5	0	4	4	53

<p>2</p>	<p>AC Fundamentals Trainer along with module and base unit to perform following topics :</p> <ul style="list-style-type: none"> • Measuring AC Voltage, Current and Impedance • Measuring and Setting Frequency • Inductors, Phase Angle, Series vs Parallel, Inductive Reactance and Impedance • Series and Parallel RL Circuits • Electromagnets, Solenoid, Relay • Transformer Windings, Mutual Inductance, Turns and Voltage Ratios, Secondary Loading • Capacitors, Series vs Parallel, Capacitive Reactance • Series and Parallel RC Circuits • RC Time Constants • RC/RL Wave shapes • Series and Parallel RLC Circuits • Series Resonant Circuits • Q and Bandwidth of a Series/Parallel RLC Circuit • Resonant Frequency in a Parallel RLC Circuit • Power Division and Power Factor • Filters: Low-Pass, High Pass, Band-Pass and Band-Stop <p>(With complete accessories and instruction manual)</p>	40	0	5	0	4	4	53
<p>3</p>	<p>Solid state Semiconductor Trainer along with module and base unit to perform following topics:</p> <ul style="list-style-type: none"> • Semiconductor Component Identification and Control of a Semiconductor Switch • Diode: DC Characteristics, Diode Waveshaping • Rectifiers: Half-Wave, Full-Wave Diode Bridge, Power Supply Filtering, Voltage Doubler • Zener Diode and Voltage Regulation • Transistor: Testing the Junctions, PNP Transistor Current Control Circuit, Emitter-Base Bias Potentials, Collector Current vs Base Bias, DC Circuit Voltages, Load Lines • Semiconductor Devices Circuit Board • Multistage Amplifier Introduction • Common Base, Common Emitter and Common Collector Circuits AC/DC Operation • Temperature Effect on Fixed Bias Circuit and Voltage Divider Bias Circuit • Transistor Parameters Familiarization and Understanding the Specification Sheet • RC Coupled Amplifier DC Operation, AC Voltage Gain and Phase Relationship, Frequency Response • Transformer Coupled Amplifier AC/DC Operation, Frequency Response • Direct Coupled Amplifier AC/DC Operation , Frequency Response • Amplifier Circuits • Single-Ended Power Amplifiers: Introduction, DC Operation, AC Operation, Voltage Gain, Power Gain • Phase Splitter DC Operation • Voltage Gain and Input/Output Signal Phase Relationship • Push-Pull Power Amplifiers: DC Operation, AC Operation, Voltage and Power Gain • Complementary Power Amplifiers: DC Operation, AC Operation, Voltage Gain and Power Gain • Darlington Pair Current Gain Characteristics, Input and Output Impedance • Oscillators Operation: Unijunction, Hartley, Colpitts • JFET: Operating Characteristics, Effect of Gate Bias on Pinch-Off, Dynamic Characteristics, DC Amplifier Operation, Voltage Gain, DC Current Source Operation and Power/Load Voltage Variation 	40	0	5	0	4	4	53

	<p>Current Source Operation and Power/Load voltage variation</p> <ul style="list-style-type: none"> • MOSFET: Zero Bias Characteristic, Modes of Operation, Voltage Amplifier, Dual Gate MOSFET Mixer • UJT: Operating Characteristics, Waveform Generation • Thermistor and Photoresistor Operation • Fiber Optic Light Transfer <p>(With complete accessories and instruction manual)</p>							
4	<p>Thyristors And Power Control Trainer along with module and base unit to perform following topics:</p> <ul style="list-style-type: none"> • Thyristor: Component Familiarization, Circuit Fundamentals • Silicon Controlled Rectifier (SCR): Testing, DC Operation, Gate Trigger Voltage and Holding Current • Rectifiers: Half-Wave Rectifier, SCR Controlled Half-Wave Rectifier, Full-Wave Rectifier, Phase Control • UJT: Characteristics, Half and Full-Wave Phase Control • Bidirectional Conduction, Triggering Modes (4) <p>With complete accessories and instruction manual)</p>	40	0	5	0	4	4	53
5	<p>Digital Logic Fundamentals Trainer along with module and base unit to perform following topics :</p> <ul style="list-style-type: none"> • Component Location and Identification • Operation of General Circuits and IC Package Fundamentals • Logic Functions: AND, NAND, OR, NOR, Exclusive OR, NOR Gates • Dynamic Response of XOR/XNOR Logic Gates • DC Operation of a NOT and an OR-TIE • Transfer Characteristics of a Schmitt and a Standard LS TTL Gate • Flip-Flops: Set/Reset, D-Type, Static JK, Dynamic Operation • Tri-State Gate: Output Enable Control, Sink and Source Control • TTL and CMOS: Static Trigger Levels, Dynamic Transfer Characteristics • Static and Dynamic Control of a Data Bus • Component Location and Identification • Operation of General Circuits and IC Package Fundamentals • Basic Counter Control Functions, Ripple Counter Waveforms, Synchronous Counter Circuit Waveforms and Glue Logic • Basic Operating Modes of the Shift Register • Shift Register Circuit Waveforms • Fundamental Binary Addition, Addition with Input and Output Carry • Fundamental Binary Comparisons • Comparators and Counter Modulus Control • Circuits • Component Location and Identification • Operation of General Circuits and IC Package Fundamentals • Fundamentals: BCD Decoder Operation, Priority Encoder Operation, ADC Operation, DAC Operation • Data Selector, Multiplexer, 1-Line-to-8-Line Demultiplexer • 1-Line-to-8-Line Demultiplexer • LED Decoder/Driver, 7-Segment LED Display, ODD and EVEN Parity • ODD and EVEN Parity • Parity Generator/Checker Glue Logic • Circuits and Digital Circuits <p>With complete accessories and instruction manual)</p>	40	0	5	0	4	4	53

6	Digital logic trainer Breadboard based <ul style="list-style-type: none"> • Input Logic switches • Output LED's • Power supplies • Seven segment displays • TTL and CMOS provision • Clock Signals • Connecting wires • Breadboard size: 2400 tie points or above (Along with all standard accessories mention in the brochure and instructional manual and Student manual)	40	0	5	0	4	4	53
7	Analog Trainer Breadboard Based <ul style="list-style-type: none"> • Breadboard size: 2400 tie points or above • Function generator (sine , square, Triangle, and Ramp • Fixed and variable power supplies $\pm 0\sim 25V$, $\pm 12V$, $+5V$ (Along with all standard accessories mention in the brochure and instructional manual and Student manual)	40	0	5	0	4	4	53
8	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 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: <ul style="list-style-type: none"> • Traffic Lights • Electro-Pneumatics • Electro-Mechanical – DC Motor • Electro-Mechanical – Stepper Motor • Level Process Control 	40	0	5	0	4	4	53

9	Analog Dual Trace Oscilloscope, 40 MHz: The module should include CH 1, CH 2, CHOP, and ALT display modes, an operating instruction manual, one line cord, and two low-capacitance probes. (With complete accessories and instruction manual)	40	5	5	0	4	4	58
10	Laboratory Instruments demonstration type: The Laboratory Instruments module should consist of the following devices. • DC meter • Sine/square wave generator • Electronic volt-ohm-millimeter (VOM) • AC/DC power supply (With complete accessories and instruction manual)	40	5	5	0	2	4	56
11	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)	40	5	5	0	2	4	56
12	Digital storage oscilloscope 100 MHz Bandwidth with 2 Input Channels with color display. (With all accessories mention in the brochure and instructional manual)	40	0	5	0	4	4	53
13	Digital Multimeter with dual measurement displays (Bench Type) DC Voltage :100 mV ~ 1000V DC Current: 100 μ A ~ 10A Resistance : 100 Ω ~ 100 M Ω AC Voltage: 100mV ~ 750V AC Current: 100mA ~ 10A Power Source: 230 V (With all accessories mention in the brochure and instructional manual)	0	0	0	0	0	0	0
14	Digital Clamp on meter: AC Amp: 200A AC Vtg: 600V DC Vtg: 600V Ohms: 20M Ω (With complete accessories and instruction manual)	40	0	5	0	4	4	53
15	Digital Multimeter (Hand Held): DC Voltage : 1000 V DC Current: 10A Resistance : 20 M Ω AC Voltage: 600 V AC Current: 10 A (With complete accessories and instruction manual)	40	0	5	0	4	4	53

16	Digital LCR Meter bench type Resistance : 0.00001Ω ~ 99999kΩ Capacitance: 0.00001pF ~ 99999uF Inductance : 0.00001mH ~ 99999H Quality Factor : 0.0001 ~ 9999 Impedance : 0.00001Ω ~ 99999kΩ (With all accessories mention in the brochure and instructional manual)	0	0	0	0	0	0	0
17	Multiple output Dual range DC power supply: 0 ~ 30V x 2, 0~5amp x 2 (With complete accessories and instruction manual)	40	0	5	0	4	4	53
18	Single and 3-phase Transformer Trainer: <ul style="list-style-type: none"> • 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 • Single-Phase Paralleling • 3-Phase Paralleling • Efficiency calculation of each transformer • Open/no load test • Load/Short circuit • Polarity test 	40	0	5	0	4	4	53
19	Motor Winding Kit: <ul style="list-style-type: none"> • Equipment Familiarization • Split-Phase Capacitor-Start Motor • Three-Phase Squirrel Cage Induction Motor 	40	0	0	0	4	4	48
20	Electricians Tool belt Tool Kit 13Pcs:(One kit for each student)	40	0	5	0	0	4	49

Engr: Sana Ullah, _____
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Assistant Professor (Electrical) GCT, Peshawar

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Model

IT-2000
+
IT-2001
EES, Pakistan

IT-2000 + IT-2001 + IT-
1001 + IT-2016
EES, Pakistan

IT-2000 + IT-2001 + IT-
2003 + IT-2004 + IT-
2005 + IT-2010 + IT-
2011 + IT-2012 + IT-
2013
EES, Pakistan

IT-9000 + IT-9001 + IT-
9003 + IT-910A + IT-
910C
EES, Pakistan

IT-3000 + IT-3001 + IT-
3002 + IT-3003 + IT-
3004 + IT-3005 + IT-
3007 + IT-3008 + IT-
3009 + IT-3010 + IT-
3011
EES, Pakistan

IT-300
EES, Pakistan

IT-200
EES, Pakistan

IT-1200S-40

Modules:
IT-5100 IT-5101
IT-5103
IT-5105

EES Pakistan
ISO Certified Company

UTD-2052CL Uni-T China Accepted: The Digital Oscilloscope is best than Analog
IT-200 EES Pakistan + UT- 33B+Uni-T China Complete Bruchar not Provided
Model: UTG-2025A Uni-T CHINA
UTD-2102CEX Uni-T China
Not Quoted
UT-201+ Uni-T China
UT-55 Uni-T China

Rejected Under Specifications
MCH-305DII MCH China
IT-11001 EES Pakistan ISO Certified Company
IT-MWK-05 ISO Certified Company
Pak
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