COMSATS University Islamabad, Lahore Campus
Defence Road, Off Raiwind Road, Lahore

Tender No. CUI-LHR-TN-13-20-1332
Case # 2973

Single Stage Two Envelop Procedure

Title of Tender: **Lab Equipment's for Lab of Electrical & Computer Engineering Department**

TERMS AND CONDITIONS

1. **All pages of bidding documents are mandatory to be signed / stamped, meaning thereby bidder agrees to our terms & conditions mentioned herein, failing which the bid may be rejected.**

2. **Any addition, deletion or modification of any clause of the procurement terms & conditions/ BoQs of CUI Lahore Campus by any vendor will not be acceptable and may lead to rejection of the bid.**

3. **Only registered Suppliers, who are on Active Taxpayers List (ATL) of FBR, are eligible to participate in tender.**

4. The contract will be executed and handed over in satisfactory conditions up to the entire satisfaction of COMSATS University Islamabad, Lahore Campus.

5. Documents along with Pay Order / Demand Draft amounting to **Rs. 1000/-** as a tender document fee (Non-Refundable) shall be submitted in favor of COMSATS University Islamabad, Lahore Campus to the address given below. No bid will be accepted without tender documents' fee.

6. Part / Advance payments is not allowed.

7. **The exact completion/installation/ delivery time from the date of the purchase / work order will be 30 days. The handing over / completion time for this contract is of critical importance.**

8. Your bid proposal should be inclusive of freight and all other taxes and to be delivered at COMSATS University Islamabad (CUI), Lahore Campus's premises.

9. After opening of bids, CUI-Lahore Campus will examine the bids for completeness as per tender document.

10. Purchase order (s) will be awarded to the lowest or technically recommended bidder (s) on the basis of item wise / subtotal wise / grand total wise according to the nature of BoQs.

11. The bid should be submitted in a sealed envelope up to **January 22, 2020** on or before **1400hrs** and will be opened on the same date **at 1430hrs** in the presence of available bidders.

12. COMSATS University Islamabad, Lahore Campus, will follow the PPRA rule of **single stage two envelope procedure;**

    i.   The bid shall comprise a single package containing **two separate envelopes.** Each envelope shall contain separately the **financial proposal** and the **technical proposal;**

    ii.   The envelopes shall be marked as **"FINANCIAL PROPOSAL" and "TECHNICAL PROPOSAL"** in bold and legible letters to avoid confusion**;**

    iii. Initially, only the envelope marked **"TECHNICAL PROPOSAL"** shall be opened**;**

Signature & Stamp of Bidder

iv. The envelope marked as **"FINANCIAL PROPOSAL"** shall be retained in the custody of the procuring agency without being opened;

v. The procuring agency shall evaluate the technical proposal in a manner prescribed in advance, without reference to the price and reject any proposal which does not conform to the specified requirements;

vi. During the technical evaluation no **amendments** in the technical proposal shall be permitted;

vii. The financial proposals of bids shall be opened publicly at a time, date and venue announced and communicated to the bidders in advance;

viii. After the evaluation and approval of the technical proposal the procuring agency, shall at a time within the bid validity period, publicly open the financial proposals of the technically accepted bids only. The financial proposal of bids found technically nonresponsive shall be returned un-opened to the respective bidders;

ix. and

x. The bid found to be the lowest evaluated bid shall be accepted.

13. The envelope should be marked as under;

> **Secretary, Purchase Committee**
> **COMSATS University Islamabad, Lahore Campus**
> Defence Road, Off Raiwind Road, Lahore.
> Tel: 042-111-001-007, Ext: 875

14. The envelope shall also bear the word **"CONFIDENTIAL"** and following identification quotation of **"Lab Equipment's for Lab of Electrical & Computer Engineering Department".**

15. The bid form (BoQs) must be duly filled in, stamped and signed by the authorized representative of the bidder.

16. **If the vendor fails to deliver the goods / services to COMSATS University Islamabad (CUI), Lahore Campus within the given deadline, any of the following can be opted by CUI Lahore campus on the recommendation of the end user and approval of the authority;**

    a. An extension in the delivery period may be granted in case a valid reason/justification with necessary documentary evidence is provided by the vendor supporting the reason for delay.
    b. A penalty upto 10% of the invoice value may be charged.
    c. Purchase order may be cancelled along with confiscation of earnest money if the vendor fails to deliver the goods / services after the initial or extended delivery time, as the case may be.

17. If the delivered goods / services are not according to the required quality standards / specifications, the same shall be liable to be rejected after inspection. The vendor would be required to supply as per requirements mentioned in our BoQs, otherwise the purchase / work order will be cancelled after due date with confiscation of earnest money.

18. Deduction of Income Tax and any other tax will be deducted at source according to Government prevailing rules.

19. Payment will be made on submission of Invoice in the name of "COMSATS University Islamabad (CUI), Lahore Campus" with a copy of delivery challan (s) after the complete order has been supplied, inspected and accepted which includes delivery / installation, and COMSATS acceptance / inspection thereof.

20. All prices should be valid for at least **90 days.** Withdrawal or any modification of the original offer within the validity period shall entitle CUI-Lahore Campus to forfeit the earnest money in favor of the CUI-Lahore Campus and / or put a ban on such vendor participation in tenders / works.

21. It is the sole responsibility of the agent / supplier / manufacturer to comply with the applicable laws, be national or international.

22. In case of any dispute or grievance, the matter shall be addressed as per PPRA rules.

23. The CUI-Lahore Campus reserves the right to modify the quantities of goods / services at any time before the award of purchase / work order.

24. Minimum one-year warranty shall be provided from the date of installation or standard warranty whichever is higher

25. **05% of the total value of the Invoice will be retained as security by COMSATS University Islamabad (CUI), Lahore Campus, and will be released after warranty period i.e. 01 Year (for Sr. # 9, 10 & 16) which will be counted from the date of Installation / Completion of work / Supply.**

26. **The bidder is required to furnish in form of Bank deposit/ CDR / Pay order equivalent to 2% of the total Bid price as Earnest Money crossed in favor of "COMSATS University Islamabad, Lahore Campus".**

27. **CUI Lahore Campus** reserves the rights to reject the bid if;

      i. Received without earnest money
     ii. Received later than the date and time fixed for tender submission
    iii. The tender is unsigned/ unstamped
     iv. The offer is ambiguous
      v. The offer is conditional
     vi. The offer is from a firm, which is black listed by any Govt. Office.
    vii. The offer is received by telephone/telex/fax/telegram.
   viii. Any unsigned / ambiguous erasing, cutting / overwriting etc. is made.

28. The bidder should furnish a certificate as worded below in token of acceptance of all the terms and conditions of the tender otherwise the tender will not be considered under any circumstances.

29. The undersigned affirm that the terms and conditions as contained in this document have been read and accepted and that in the event of selection of my/our rate the agreement in the prescribed form will be entered into:

   - **Company / Vendor Name:………………………………………………………..….….………...**

   - **Postal Address:……………………………………………………………………………………….**

   - **Tel. / Mobile:………………………...…………………………Email:……………….……………...…**

   - **NTN# :………………………………………….GST#:…………………………...………**

   - **Signature: ……………………………………….**

   - **Please also attach the Certificate supporting being Active Taxpayer as per requirement of FBR.**

Signature & Stamp of Bidder

BoQs of Lab Equipment's for Lab of Electrical & Computer Engineering Department

Technical Portion (Please mention the quoted model/ brand in technical portion with no mention of price otherwise the bid will be rejected)

Sr. #	Item Name & Specifications	Qty	Please mention the quoted Model / Brand with meeting the all specifications mentioned in BoQs
No change in the BoQs (Specs & Qty.) of CUI-Lahore Campus, as detailed below, is allowed. Any additional information may be mentioned in the blank columns (i.e. model / brand or Price). Any modification in CUI-Lahore Campus BoQ may lead to rejection of bid (fully or partially).		
Electric Machines Lab			
01	**Soldering Station** 968ESD, Make: Fonton or Equivalent Power Consumption: 60W Input Voltage: AC220/240V, Ceramic Heater Temperature range: 175ºC~500ºC (347ºF~932ºF) Sample Available in Power Electronics Lab	1 No.	
Power/Industrial Electronics Lab			
02	**LCR Meter** TECPEL 615 or Equivalent Measuring Range: L = 0.000µH – 1000H C = 0.000pF – 20.000mF Max. Basic accuracy: 0.1% Maximum test signal frequency : 100kHz	1 No.	
03	**Digital Multimeter** UNI-T (UT 55) or Equivalent Measurement: AC current, AC voltage, capacitance, DC current, DC voltage, frequency, resistance, temperature DC voltage measuring range: 200m/2/20/200/1000V AC voltage measuring range: 2/20/200/750V DC current measuring range: 2m/20m/200m/20A AC current measuring range: 20m/200m/20A Resistance measuring range: 0,1...200/2k/20k/200k/2M/20M/200MΩ Capacitance measuring range: 2n/20n/200n/2µ/20µF Frequency measuring range: 20kHz	1 No.	

04	**Watt Meter max 10A** Make: Benetech or Equivalent Model: GM86 or equivalent Power supply:220V 50Hz Max 10A(within 2.2KW) Accuracy: 1.0 Constant: 6400imp/kWh Power dissipation: <1W Monitoring of the current value of the active power Monitoring of the current voltage /current / frequency Record the total time consumption Record the total electricity consumption Large LCD display	**2 Nos.**	
05	**3 Phase Transformer Module with Isolation 4. Banana Type Jack / Female Connector on Star Side.** **One 3 Phase Plug/Socket Connector on Delta Side.** Specification: Input Voltage = 440V, Input Current = 1.3A, Input Connection = Delta Output Voltage = 24V, Output Current = 24A Output Connection = Star Power = 1000VA / 800W AS Per sample available in machine lab	**2 Nos.**	
06	**USB / PPI Multi-Master Cable (PPI = RS-485)** SIEMENS 1P 6ES7 901-3DB30-OXA0 or equivalent Transmission rate, max. 187.5 kbit/s; 9.6 / 19.2 / 187.5 kbit/s; PPI 10/11 bit LED status display Tx (green): USB send display; Rx (green): USB receive display; PPI (green): RS-485 send display Potential separation exists As per sample in power /industrial electronics lab	**2 Nos.**	
07	**Power Supply Unit** **Make: ElettronicaVeneta Model: PS1-PSU/EVor equivalent** Output S1: +30 Vdc – 4A Rectified, filtered voltage protected with fuse. Voltage indicator LED. - Output S2: 24 Vac – 4A Protection with fuse. Voltage indicator LED. - Output S3: +5 Vdc – 2A - Output S4: +12 Vdc – 2A, -12 Vdc – 1A Regulated voltage, electronically protected from short circuits and overloads. Voltage indicator LED. - Output S5: 1.3 Vdc – 24 Vdc, 1A Regulated voltage, electronically protected from shortcircuits and overloads. Voltage indicator LED. - Output on DIN connector: 24 Vac – 0 – 24 Vac, 0.5A Voltage protected with fuse (Outputs S1 and S2 supply 4 A separately and 2 A if used simultaneously) Power supply: 230 Vac 50 Hz single-phase - 200 VA **As Per Sample in power /industrial electronics lab**	**5 Nos.**	

Electronics Lab		
8	**Oscilloscope Probe** **As Sample Available in Electronics Lab**	**15 Nos.**	
9	**Function Generator** SFG-1003 or Equivalent DDS Technology and FPGA Design Frequency Range: 0. 1Hz ~ 3MHz High Frequency Accuracy: 20ppm High Frequency Stability: 20ppm Max. Frequency Resolution : 100 mHz Low Distortion Sine Wave : -55dBc, 0. 1Hz~200 kHz Voltage Display **One Year Warranty**	**1 No.**	

10	**Universal Lab Trainer**
	ULT-3000 or equivalent
	DC Power Supplies Module
	Fixed Output: +5V/1A, -5V/1A, +12V/0.5A, -12V/0.5A
	Variable Output: +0V ~ +24V/1A, -0V ~ -24V/1A
	All power supplies are short circuit protected
	2. AC Power Supplies Module
	19V–15V–9V–0V–9V–15V-19V
	3. Function Generator (2 Channels) & Clock Generator (2 Channels) Modules
	Sine, Triangle and Square waveform output
	Frequency range: 1Hz to 1MHz in 6 decades
	With fine adjust, Amplitude and DC offset control
	Clock output 1Hz to 1MHz in 6 decades
	Six frequency ranges:
	   1Hz to 10Hz
	   10Hz to 100Hz
	   100Hz to 1KHz
	   1KHz to 10KHz
	   10KHz to 100KHz
	   100KHz to 500KHz
	Sine wave output: 0 to 12V peak to peak variable
	Triangle wave output: 0 to 8V peak to peak variable
	Square wave output: 0 to 22V peak to peak variable
	4. Solderless Breadboard Module
	Interconnected nickel plated with a total of 1860 tie points nickel plated contact, fitted all DIP sizes and all components with lead and solid wire in diameter of AWG #22-30 (0.3-0.8mm)
	5. Two Pulse Switches Module
	    80uS Single Shot Pulse (Positive & Negative)
		6 Nos.	

2 units push button switch contain switches debouncer for eliminating the bounce caused by switch from "open" to "close" or from "close " to "open" position.

6. Two digits 7-segment LED Display Module
Numerical designs and resultant
display Truth Table

7. 16-Bits LED Indicators with buffer Module
Sixteen LED's separate input terminals in three colors. (RED, Yellow & Green). The LED will be lighted up when input is at "HI Level", and it will be turned off when it is at no input or at "LO Level". Capable for Traffic Light Experiments.

8. 16-Bits HI/LO Data Output Switches Module
16 units slide switches and corresponding output terminals. When switch is set at "down" position, the output is LO level; contrarily, it is to be HI level when setting at "up" position.

9. TTL/CMOS Selection Switch
Select TTL or CMOS Mode for data switches

10. 3-State Logic Probe Module
HI, LO, FLOAT 3 Logic Level Testing
CMOS / TTL Level Selection

11. Speaker Module
8Ohm, 0.25W With Buffer

12. Digital DC Volt Meter Module   4 Digits LED display
Four voltage ranges: 0V to
199.9VDC
0V to 19.99VDC
0V to 1.999VDC
0V to 199.9mVDC
Input Impedance: 10Mohm for any range

13. Adaptors Module
5 Channels Banana to 2mm Adaptor Interface Socket and turn pins sockets

14. Universal Connector Fixed Holder Module (Optional)
It reserves universal connector fixed holder on the panel in order to be connected with various universal connectors, which are available listed as follows:
UC-01: Straight Header 60 pin UC-02: Card Edge Connector 2.54mm 62 Pin
UC-03: Card Edge Connector 3.96mm 28 Pin
UC-04: RS-232 Connector 25 pin D-Sub Connector (Male & Female)
UC-05: USB Connectors
UC-06: Centronics / Parallel 2.54mm 36 Pin
The ULT-3000 is shipped with a comprehensive CD Format Experiments Manual, Instruction Manual with Self Maintenance Guide and a power cord.
Power Supply: 240VAC, 50Hz (Fused Protected)
Warranty One Year

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11	**Regular Dc Power Supply, 30V, 5A** MCH-305D-II or equivalent Output Type: Dual Output Power: 101 - 200W Output Current: 0-5A Input Voltage: 220V/240V Output Voltage: 0-30V	2 Nos.	
Embedded System Lab			
12	DMM UNI-T(UT 55) or Equivalent Measurement: AC current, AC voltage, capacitance, DC current, DC voltage, frequency, resistance, temperature DC voltage measuring range: 200m/2/20/200/1000V AC voltage measuring range: 2/20/200/750V DC current measuring range: 2m/20m/200m/20A AC current measuring range: 20m/200m/20A Resistance measuring range: 0,1...200/2k/20k/200k/2M/20M/200MΩ Capacitance measuring range: 2n/20n/200n/2μ/20μF Frequency measuring range: 20kHz	1 No.	
Project & Research Lab			
13	**Variable Frequency Drive** IG5A (LS-Korea) 0.75KW or Equivalent Selectable V/f, sensor less vector control Motor parameter Auto-tuning Powerful torque at overall speed range 0.1 ~ 400Hz frequency output -15% ~ +10% input voltage margin Fault history: Last 5 faults 0~10Vdc / -10 ~ +10Vdc analog input IP20 enclosure, UL Type 1 (Option) Selectable manual/automatic torque boost Selectable PNP/NPN input signal 2nd motor control and parameter setting Built-in Dynamic braking transistor as standard Enhanced process PID control Built-in RS485 (LS Bus / Modbus RTU) communication Cooling fan On/Off control & Easy change Remote control using external keypad * RJ45 cable(Optional) Upgraded functions: Sleep & Wake-up (Energy savings) KEB(Kinetic Energy Buffering) protection Low leakage PWM algorithm Monitoring & commissioning PC based software tool (Drive View	02 Nos.	

14	**Solenoid Valves** 12V DC 2-position 3-way Small Mini Electric Solenoid Valve	**5 Nos.**	
15	**Current Sensor** 5A, AC/DC open loop hall Current Transduce Make : LEM or equivalent	**5 Nos.**	
16	**Fatek PLC with Power Cable and Software or Equivalent** CPU: FBS 16 TC/RTD or equivalent Number of input points: 16 points Sensor type: RTD Power consumption: 24VDC -15%/+20%,2W max. Isolation method: Transformer (power) and photocouple (signal) isolation, 500VAC, 1minture, isolation between each channel Warranty: 1 Year	**2 Nos.**	
17	**Communication Cables for PLC** Compatible for PLC Unit as described in Serial No. 16	**5 Nos.**	
18	**Analog input Card for PLC** **Model: FBS B2A1D or equivalent** **Compatible for PLC Unit as described in Serial No. 16** Common Specification: Indicator(s) : No Internal Power Consumption: 5V, 100mA (Max. Load) Operating Temperature: 0 〜 60 ℃ Storage Temperature: -20 〜 80 ℃ Max. and Min. output loading : Voltage Output: 2K 〜 1MΩ Current Output: 0 〜 500Ω Output Range 0 〜 10V (Voltage) 0 〜 +20mA (Current)	**2 Nos.**	
19	**HMI for PLC** **MT6070IH Weintek HMI or Equivalent and** **Compatible for PLC Unit as described in Serial No. 16** Display: 7" 65,536 color TFT LCD CPU and core logic: 32Bit RISC 400MHz processor DRAM: 64 MB DDR2 on board Storage: 128 MB flash memory on board, I/O: 3 serial ports: Com1: RS-232/RS-485 2w/4w, Com2: RS-232, Com3: RS-232/RS-485 2w, 1 USB 1.1 host 1 USB 2.0 high speed device, RTC: Built-in Power input: 24±20%VDC,250mA@24VDC Dimension (W x H x D): 200 x 146 x 42.5mm Software: EB8000 V2.0.0 or later Warranty = 1 Year	**2 Nos.**	

20	**RFID Tag + Reader** MFRC 522 or equivalent Analog supply voltage: Max. 3.6V,Typ. 3.3V Min. 2.5V Digital supply voltage: Max. 3.6V,Typ. 3.3V Min. 2.5V Analog supply current: Max. 10mA Digital supply current: Max. 9mA	**5 Nos.**	
21	**Voltage Sensor** 25V, AC/DC open loop hall Voltage Transduce Make: LEM or equivalent	**5 Nos.**	
22	**Motion Sensor** HC-SR 501 PIR Motion Sensor or equivalent Voltage: 5V – 20V ◦ Power Consumption: 65mA TTL output: 3.3V, 0V Lock time: 0.2 sec Trigger methods: L – disable repeat trigger, H enable repeat trigger Sensing range: less than 120 degree, within 7 meters Temperature: – 15 ~ +70	**5 Nos.**	
23	**Humidity Sensor** DHT 11 or equivalent Measurement Range: 20-90%RH 0-50 ℃	**5 Nos.**	
24	**Gas Sensors** MQ-2= 01 Quantity For Combustible gas and smoke. MQ-135 = 01 Quantity For NH3, NOx, Alcohol, Benzene, Smoke, CO2 MQ-9 = 01 Quantity For CO and combustible gas MQ-5 = 01 Quantity For Methane, Propane and Butane. MQ-3 = 01 Quantity For Alcohol, Benzine, CH_4, Hexane, LPG, CO	**5 Nos.**	

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25	**Arduino Starter Kit** Arduino UNO R3 ARDUINO UNO R3 SMD or equivalent 1 No. 16 x 2 LCD Display 16×2 1 No. MB102 BREAD BOARD MB102 1 No. JUMPER WIRES MALE TO MALE 1 No. JUMPER WIRES MALE TO FEMALE 1 No. Servo motor sg90 1 No. or equivalent Small 5V DC motor small motor 1 No. IR RECEIVER+ TRANSMITTER receiver 1 No. 28BYJ48 5V STEPPER MOTOR WITH ULN2003 DRIVER BOARD MOTOR+ DRIVER 1 No. or equivalent Gas Sensor MQ-X MQ-X or equivalent 1 No. MAX7219 MODULE max7219 or equivalent 1 No. 4 Digit Seven Segment Red LED Display 0.56 SM42056 4 Nos. DIGIT 1 No. 1 DIGIT SEVEN SEGMENt 1 No. DIGIT 1 No. LM35 Sensor SENSOR 1 No. or equivalent TIP122 POWER TRANSISTOR 2 Nos. or equivalent A1015 PNP TRANSISTOR 5 Nos. C945 NPN TRANSISTOR 5 Nos. 10K VARIABLE VOLUM 2 Nos. 100K VARIABLE VOLUM 2 Nos. 5MM LED RED 5 Nos. 5MM LED GREEN 5 Nos. 5MM LED YELLOW 5 Nos. 5MM LED WHITE 5 Nos. 12 x 12mm x 7.5mm Push Button NO CAP 5 Nos. 12 x 12mm x 7.5mm Push Button RED 3 Nos. 12 x 12mm x 7.5mm Push Button GREEN 3 Nos. 12 x 12mm x 7.5mm Push Button WHITE 3 Nos. 12 x 12mm x 7.5mm Push Button GREY 3 Nos. HEADER FEMALE 2 Nos. HEADER MALE 2 Carbon Film Resistors widget 100R 30PCS 1 Carbon Film Resistors widget 1K 30PCS 1 Carbon Film Resistors widget 4.7K 30PCS 1 Carbon Film Resistors widget 10K 30PCS 1 Carbon Film Resistors widget 47K 30PCS 1 Carbon Film Resistors widget 100K 30PCS 1 Carbon Film Resistors widget 1M 30PCS 1 BREAD BAORD SHIELD SMALL 1 LDR SENSOR 5MM 5 BOX COMPONENT BOX 1	**5 Nos.**	
26	**Raspberry Pi Starter Kit or equivalent** 1 Raspberry Pi MODEL B+ 1 (No) or equivalent 2 Raspberry Pi 3 Official Case RED+WHITE 1 (No) or equivalent 3 BREAD BOARD MB102 1 (No) or equivalent 4 RASPBERRY PI ADAPTER 2AMP 1 (No) or equivalent 5 USB CABLE2AMP 1 (No) 6 GPIO ADAPTER WITH CABLE T-COBBLER PLU 1 (No) 7 HDMI CABLE FOR LCD 1 (No)	**3 Nos.**	

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	8 PUSH BUTTONS RED,GREEN,BLUE,WHITE,BLACK 5 (No) 9 TEMPERATURE AND HUMIDITY SENSOR DHT11 1 (No) 10 LIGHT SENSOR LM393 LDR MODULE 1 (No) 11 RESISTORS 330,470,1K,10K,100K 100 Nos. 12 PACKING BOX 300mmX200mmX60mm 1 (No) 13 MICRO SD CARD 16GB 1 (No) 14 Jumper wireHOLE TO HOLE 1 (No) 15 Jumper wirePIN TO PIN 1 (No) 16 LED RED, GREEN, YELLOW 75 Nos. 17 MICRO SD CARD READER MICRO SD CARD READER 1 No.		
27	**IOT Starter Kit** 1 ESP8266 WI-FI Nodemcu board or equivalent 1 (No) 2 Micro USB cable 1 (No) 3 I2C 1602 LCD Display Screen or equivalent 1 (No) 4 SG90 Servo Engine 1 (No) or equivalent 5 DHT11 Temp & Humi Sensor module1 or equivalent 6 2 Relay module 1 (No) 7 Stepper motors bridge 1 (No) 8 potentiometer (10 k variable resistor) 3 Nos. 9 buzzer 1 (No) 10 LDR Module 4 PIN 3 Nos. 11 Infrared receiver (VS1838B) 1 (No) or equivalent 12 Infrared remote control 1 (No) 13 LED (6x white, 6X red, 6x Yellow, 6X green) 24 Nos. 14 push Buttons Caps 5 Nos. 15 Resistors (20X 470ohm, 20x 10k, 20x 1Kohm, 1Mohm) 65 Nos. 16 Jump pins wire M to M 1 No. 17 Jump pins M to F 1 No. 18 Jump pins F to F 1 No. 19 Bread board MB102 1 No. 20 plastic box 1 No	**3 Nos.**	

Bid Evaluation Criteria

All bids shall be evaluated in accordance with the following evaluation criteria and other terms & conditions set forth in this bidding document.

a. The bids shall be evaluated to strictly ensure that the quoted brand/ model meet all the BoQ/ specification requirements given in the tender document for each item.

b. In addition to the BoQ requirements, vendors must meet the vendor qualification criteria /company profile requirements (if any), as set forth in this tender document.

c. Supporting literature of the quoted model must be attached for verification & technical evaluation of the required specification by the technical committee. In case of any clash is found between the quoted model and the supported literature may lead to rejection of bid.

Signature & Stamp of Bidder

Financial Portion (Price and Brand/Model to be mention only in Financial Proposal in a separate sealed envelope) Strictly on our BoQs Form.

Vendors are required to provide both unit and total price of each item and calculations must be made carefully to avoid mistakes. However, in case, total price does not match with the unit price and quantity due to calculation error or typo error, any of the following can be opted 1. The bid may be rejected on the reason of ambiguity (OR) 2. Unit price will be considered as final and total price of the respective item will be calculated by multiplying it with the quantity required. Sub-totals and grand total will also be corrected accordingly.					
No change in the BoQs (Specs & Qty.) of CUI-Lahore Campus, as detailed below, is allowed. Any additional information may be mentioned in the blank columns (i.e. model / brand or Price). Any modification in CUI-Lahore Campus BoQ may lead to rejection of bid (fully or partially).			Prices should be quoted inclusive of all applicable taxes		
Sr. #	Item Name & Specifications	Qty	Quoted Model / Brand / Make	Unit Price (Rs)	Total Price (Rs)
Electric Machines Lab					
01	**Soldering Station** 968ESD, Make: Fonton or Equivalent Power Consumption: 60W Input Voltage: AC220/240V, Ceramic Heater Temperature range: 175ºC~500ºC (347ºF~932ºF) Sample Available in Power Electronics Lab	1 No.			
Power/Industrial Electronics Lab					
02	**LCR Meter** TECPEL 615 or Equivalent Measuring Range: L = 0.000µH – 1000H, C = 0.000pF – 20.000mF Max. Basic accuracy: 0.1% Maximum test signal frequency: 100kHz	1 No.			
03	**Digital Multimeter** UNI-T (UT 55) or Equivalent Measurement: AC current, AC voltage, capacitance, DC current, DC voltage, frequency, resistance, temperature DC voltage measuring range: 200m/2/20/200/1000V AC voltage measuring range: 2/20/200/750V DC current measuring range: 2m/20m/200m/20A AC current measuring range: 20m/200m/20A Resistance measuring range: 0,1...200/2k/20k/200k/2M/20M/200MΩ Capacitance measuring range: 2n/20n/200n/2µ/20µF Frequency measuring range: 20kHz	1 No.			

Signature & Stamp of Bidder

04	**Watt Meter max 10A** Make: Benetech or Equivalent Model: GM86 or equivalent Power supply:220V 50Hz Max 10A(within 2.2KW) Accuracy: 1.0 Constant: 6400imp/kWh Power dissipation: <1W Monitoring of the current value of the active power Monitoring of the current voltage /current / frequency Record the total time consumption Record the total electricity consumption Large LCD display	**2 Nos.**			
05	**3 Phase Transformer Module with Isolation 4. Banana Type Jack / Female Connector on Star Side. One 3 Phase Plug/Socket Connector on Delta Side.** Specification: Input Voltage = 440V, Input Current = 1.3A, Input Connection = Delta Output Voltage = 24V, Output Current = 24A Output Connection = Star Power = 1000VA / 800W AS Per sample available in machine lab	**2 Nos.**			
06	**USB / PPI Multi-Master Cable (PPI = RS-485)** SIEMENS 1P 6ES7 901-3DB30-OXA0 or equivalent Transmission rate, max. 187.5 kbit/s; 9.6 / 19.2 / 187.5 kbit/s; PPI 10/11 bit LED status display Tx (green): USB send display; Rx (green): USB receive display; PPI (green): RS-485 send display Potential separation exists As per sample in power /industrial electronics lab	**2 Nos.**			
07	**Power Supply Unit** **Make: ElettronicaVeneta Model: PS1-PSU/EV or equivalent** Output S1: +30 Vdc – 4A Rectified, filtered voltage protected with fuse. Voltage indicator LED. - Output S2: 24 Vac – 4A Protection with fuse. Voltage indicator LED. - Output S3: +5 Vdc – 2A - Output S4: +12 Vdc – 2A, -12 Vdc – 1A Regulated voltage, electronically protected from short circuits and overloads. Voltage indicator LED. - Output S5: 1.3 Vdc – 24 Vdc, 1A Regulated voltage, electronically protected from shortcircuits and overloads. Voltage indicator LED. - Output on DIN connector: 24 Vac – 0 – 24 Vac, 0.5A Voltage protected with fuse (Outputs S1 and S2 supply 4 A separately and 2 A if used simultaneously) Power supply: 230 Vac 50 Hz single-phase - 200 VA **As Per Sample in power /industrial electronics lab**	**5 Nos.**			

Signature & Stamp of Bidder

	Electronics Lab				
8	**Oscilloscope Probe** **As Sample Available in Electronics Lab**	**15 Nos.**			
9	<u>**Function Generator**</u> SFG-1003 or Equivalent DDS Technology and FPGA Design Frequency Range: 0. 1Hz ~ 3MHz High Frequency Accuracy: 20ppm High Frequency Stability: 20ppm Max. Frequency Resolution : 100 mHz Low Distortion Sine Wave : -55dBc, 0. 1Hz~200 kHz Voltage Display **One Year Warranty**	**1 No.**			

10	<u>**Universal Lab Trainer**</u>
	ULT-3000 or equivalent
	DC Power Supplies Module
	Fixed Output: +5V/1A, -5V/1A, +12V/0.5A, -12V/0.5A
	Variable Output: +0V ~ +24V/1A, -0V ~ -24V/1A
	All power supplies are short circuit protected
	2. AC Power Supplies Module
	19V–15V–9V–0V–9V–15V-19V
	3. Function Generator (2 Channels) & Clock Generator (2 Channels) Modules
	Sine, Triangle and Square waveform output
	Frequency range: 1Hz to 1MHz in 6 decades
	With fine adjust, Amplitude and DC offset control
	Clock output 1Hz to 1MHz in 6 decades
	Six frequency ranges:
	   1Hz to 10Hz
	   10Hz to 100Hz
	   100Hz to 1KHz
	   1KHz to 10KHz
	   10KHz to 100KHz
	   100KHz to 500KHz
	Sine wave output: 0 to 12V peak to peak variable
	Triangle wave output: 0 to 8V peak to peak variable
	Square wave output: 0 to 22V peak to peak variable
	4. Solderless Breadboard Module
	Interconnected nickel plated with a total of 1860 tie points nickel plated contact, fitted all DIP sizes and all components with lead and solid wire in diameter of AWG #22-30 (0.3-0.8mm)
	5. Two Pulse Switches Module
		6 Nos.			

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80uS Single Shot Pulse (Positive & Negative)
2 units push button switch contain switches debouncer for eliminating the bounce caused by switch from "open" to "close" or from "close " to "open" position.
6.   Two digits 7-segment LED Display Module
    Numerical designs and resultant
display   Truth Table
7.   16-Bits LED Indicators with buffer Module
Sixteen LED's separate input terminals in three colors. (RED, Yellow & Green). The LED will be lighted up when input is at "HI Level", and it will be turned off when it is at no input or at "LO Level". Capable for Traffic Light Experiments.
8.   16-Bits HI/LO Data Output
Switches Module
16 units slide switches and corresponding output terminals. When switch is set at "down" position, the output is LO level; contrarily, it is to be HI level when setting at "up" position.
9.   TTL/CMOS Selection Switch
    Select TTL or CMOS Mode for data switches
10. 3-State Logic Probe Module
    HI, LO, FLOAT 3 Logic Level Testing
    CMOS / TTL Level Selection
 	
11. Speaker Module
    8Ohm, 0.25W With Buffer
12. Digital DC Volt Meter Module   4 Digits LED display
    Four voltage ranges: 0V to 199.9VDC
0V to 19.99VDC
0V to 1.999VDC
      0V to 199.9mVDC
    Input Impedance: 10Mohm for any range
13. Adaptors Module
    5 Channels Banana to 2mm Adaptor Interface Socket and turn pins sockets
14. Universal Connector Fixed Holder Module (Optional)
It reserves universal connector fixed holder on the panel in order to be connected with various universal connectors, which are available listed as follows:
UC-01: Straight Header 60 pin UC-02: Card Edge Connector 2.54mm 62 Pin
UC-03: Card Edge Connector 3.96mm 28 Pin
UC-04: RS-232 Connector 25 pin D-Sub Connector (Male & Female)				

	UC-05: USB Connectors UC-06: Centronics / Parallel 2.54mm 36 Pin The ULT-3000 is shipped with a comprehensive CD Format Experiments Manual, Instruction Manual with Self Maintenance Guide and a power cord. Power Supply: 240VAC, 50Hz (Fused Protected) Warranty One Year				
11	**Regular Dc Power Supply, 30V, 5A** MCH-305D-II or equivalent Output Type: Dual, Output Power: 101 - 200W Output Current: 0-5A, Input Voltage: 220V/240V Output Voltage: 0-30V	2 Nos.			
Embedded System Lab					
12	**DMM** UNI-T(UT 55) or Equivalent Measurement: AC current, AC voltage, capacitance, DC current, DC voltage, frequency, resistance, temperature DC voltage measuring range: 200m/2/20/200/1000V AC voltage measuring range: 2/20/200/750V DC current measuring range: 2m/20m/200m/20A AC current measuring range: 20m/200m/20A Resistance measuring range: 0,1...200/2k/20k/200k/2M/20M/200MΩ Capacitance measuring range: 2n/20n/200n/2μ/20μF Frequency measuring range: 20kHz	1 No.			
Project & Research Lab					
13	**Variable Frequency Drive** IG5A (LS-Korea) 0.75KW or Equivalent Selectable V/f, sensor less vector control Motor parameter Auto-tuning Powerful torque at overall speed range 0.1 ~ 400Hz frequency output -15% ~ +10% input voltage margin Fault history: Last 5 faults 0~10Vdc / -10 ~ +10Vdc analog input IP20 enclosure, UL Type 1 (Option) Selectable manual/automatic torque boost Selectable PNP/NPN input signal 2nd motor control and parameter setting Built-in Dynamic braking transistor as standard Enhanced process PID control Built-in RS485 (LS Bus / Modbus RTU) communication Cooling fan On/Off control & Easy change Remote control using external keypad * RJ45 cable(Optional) Upgraded functions: Sleep & Wake-up (Energy savings) KEB(Kinetic Energy Buffering) protection Low leakage PWM algorithm Monitoring & commissioning PC based software tool (Drive View	02 Nos.			

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14	**Solenoid Valves** 12V DC 2-position 3-way Small Mini Electric Solenoid Valve	**5 Nos.**			
15	**Current Sensor** 5A, AC/DC open loop hall Current Transduce Make : LEM or equivalent	**5 Nos.**			
16	**Fatek PLC with Power Cable and Software or Equivalent** CPU: FBS 16 TC/RTD or equivalent Number of input points: 16 points Sensor type: RTD Power consumption: 24VDC -15%/+20%,2W max. Isolation method: Transformer (power) and photocouple (signal) isolation, 500VAC, 1minture, isolation between each channel Warranty: 1 Year	**2 Nos.**			
17	**Communication Cables for PLC** Compatible for PLC Unit as described in Serial No. 16	**5 Nos.**			
18	**Analog input Card for PLC** **Model: FBS B2A1D or equivalent** **Compatible for PLC Unit as described in Serial No. 16** Common Specification: Indicator(s): No Internal Power Consumption: 5V, 100mA (Max. Load) Operating Temperature: 0 ～ 60 °C Storage Temperature: - 20 ～ 80 °C Max. and Min. output loading: Voltage Output: 2K ～ 1MΩ, Current Output: 0 ～ 500Ω Output Range 0 ～ 10V (Voltage) 0 ～ +20mA (Current)	**2 Nos.**			
19	**HMI for PLC** **MT6070IH Weintek HMI or Equivalent and Compatible for PLC Unit as described in Serial No. 16** Display: 7" 65,536 color TFT LCD CPU and core logic: 32Bit RISC 400MHz processor DRAM: 64 MB DDR2 on board Storage: 128 MB flash memory on board, I/O: 3 serial ports: Com1: RS-232/RS-485 2w/4w, Com2: RS-232, Com3: RS-232/RS-485 2w, 1 USB 1.1 host, 1 USB 2.0 high speed device, RTC: Built-in Power input: 24±20%VDC,250mA@24VDC Dimension (W x H x D): 200 x 146 x 42.5mm Software: EB8000 V2.0.0 or later Warranty = 1 Year	**2 Nos.**			

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20	**RFID Tag + Reader** MFRC 522 or equivalent Analog supply voltage: Max. 3.6V,Typ. 3.3V Min. 2.5V Digital supply voltage: Max. 3.6V,Typ. 3.3V Min. 2.5V Analog supply current: Max. 10mA Digital supply current: Max. 9mA	**5 Nos.**			
21	**Voltage Sensor** 25V, AC/DC open loop hall Voltage Transduce Make: LEM or equivalent	**5 Nos.**			
22	**Motion Sensor** HC-SR 501 PIR Motion Sensor or equivalent Voltage: 5V – 20V ∘ Power Consumption: 65mA TTL output: 3.3V, 0V Lock time: 0.2 sec Trigger methods: L – disable repeat trigger, H enable repeat trigger Sensing range: less than 120 degree, within 7 meters Temperature: – 15 ~ +70	**5 Nos.**			
23	**Humidity Sensor** DHT 11 or equivalent Measurement Range: 20-90%RH 0-50 ℃	**5 Nos.**			
24	**Gas Sensors** MQ-2= 01 Quantity For Combustible gas and smoke. MQ-135 = 01 Quantity For NH3, NOx, Alcohol, Benzene, Smoke, CO2 MQ-9 = 01 Quantity, For CO and combustible gas MQ-5 = 01 Quantity, For Methane, Propane and Butane., MQ-3 = 01 Quantity For Alcohol, Benzine, CH_4, Hexane, LPG, CO	**5 Nos.**			

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25	**Arduino Starter Kit** Arduino UNO R3 ARDUINO UNO R3 SMD or equivalent 1 No. 16 x 2 LCD Display 16×2 1 No. MB102 BREAD BOARD MB102 1 No. JUMPER WIRES MALE TO MALE 1 No. JUMPER WIRES MALE TO FEMALE 1 No. Servo motor sg90 1 No. or equivalent Small 5V DC motor small motor 1 No. IR RECEIVER+ TRANSMITTER receiver 1 No. 28BYJ48 5V STEPPER MOTOR WITH ULN2003 DRIVER BOARD MOTOR+ DRIVER 1 No. or equivalent Gas Sensor MQ-X MQ-X or equivalent 1 No. MAX7219 MODULE max7219 or equivalent 1 No. 4 Digit Seven Segment Red LED Display 0.56 SM42056 4 Nos. DIGIT 1 No. 1 DIGIT SEVEN SEGMENt 1 No. DIGIT 1 No. LM35 Sensor SENSOR 1 No. or equivalent TIP122 POWER TRANSISTOR 2 Nos. or equivalent A1015 PNP TRANSISTOR 5 Nos. C945 NPN TRANSISTOR 5 Nos. 10K VARIABLE VOLUM 2 Nos. 100K VARIABLE VOLUM 2 Nos. 5MM LED RED 5 Nos. 5MM LED GREEN 5 Nos. 5MM LED YELLOW 5 Nos. 5MM LED WHITE 5 Nos. 12 x 12mm x 7.5mm Push Button NO CAP 5 Nos. 12 x 12mm x 7.5mm Push Button RED 3 Nos. 12 x 12mm x 7.5mm Push Button GREEN 3 Nos. 12 x 12mm x 7.5mm Push Button WHITE 3 Nos. 12 x 12mm x 7.5mm Push Button GREY 3 Nos. HEADER FEMALE 2 Nos. HEADER MALE 2 Carbon Film Resistors widget 100R 30PCS 1 Carbon Film Resistors widget 1K 30PCS 1 Carbon Film Resistors widget 4.7K 30PCS 1 Carbon Film Resistors widget 10K 30PCS 1 Carbon Film Resistors widget 47K 30PCS 1 Carbon Film Resistors widget 100K 30PCS 1 Carbon Film Resistors widget 1M 30PCS 1 BREAD BAORD SHIELD SMALL 1 LDR SENSOR 5MM 5 BOX COMPONENT BOX 1	**5 Nos.**			

26	**Raspberry Pi Starter Kit or equivalent** 1 Raspberry Pi MODEL B+ 1 (No) or equivalent 2 Raspberry Pi 3 Official Case RED+WHITE 1 (No) or equivalent 3 BREAD BOARD MB102 1 (No) or equivalent 4 RASPBERRY PI ADAPTER 2AMP 1 (No) or equivalent 5 USB CABLE2AMP 1 (No) 6 GPIO ADAPTER WITH CABLE T-COBBLER PLU 1 (No) 7 HDMI CABLE FOR LCD 1 (No) 8 PUSH BUTTONS RED,GREEN,BLUE,WHITE,BLACK 5 (No) 9 TEMPERATURE AND HUMIDITY SENSOR DHT11 1 (No) 10 LIGHT SENSOR LM393 LDR MODULE 1 (No) 11 RESISTORS 330,470,1K,10K,100K 100 Nos. 12 PACKING BOX 300mmX200mmX60mm 1 (No) 13 MICRO SD CARD 16GB 1 (No) 14 Jumper wire HOLE TO HOLE 1 (No) 15 Jumper wire PIN TO PIN 1 (No) 16 LED RED, GREEN, YELLOW 75 Nos. 17 MICRO SD CARD READER MICRO SD CARD READER 1 No.	**3 Nos.**			
27	**IOT Starter Kit** 1 ESP8266 WI-FI Nodemcu board or equivalent 1 (No) 2 Micro USB cable 1 (No) 3 I2C 1602 LCD Display Screen or equivalent 1 (No) 4 SG90 Servo Engine 1 (No) or equivalent 5 DHT11 Temp & Humi Sensor module1 or equivalent 6 2 Relay module 1 (No) 7 Stepper motors bridge 1 (No) 8 potentiometer (10 k variable resistor) 3 Nos. 9 buzzer 1 (No) 10 LDR Module 4 PIN 3 Nos. 11 Infrared receiver (VS1838B) 1 (No) or equivalent 12 Infrared remote control 1 (No) 13 LED (6x white, 6X red, 6x Yellow, 6X green) 24 Nos. 14 push Buttons Caps 5 Nos. 15 Resistors (20X 470ohm, 20x 10k, 20x 1Kohm, 1Mohm) 65 Nos. 16 Jump pins wire M to M 1 No. 17 Jump pins M to F 1 No. 18 Jump pins F to F 1 No. 19 Bread board MB102 1 No. 20 plastic box 1 No	**3 Nos.**			

Special Terms and conditions;

i. **Please submit the technical and financial bid (rates) on our prescribed BoQs Form and clearly mention the quoted model / brands, with complete terms and conditions signed, stamped with both bids, otherwise your bid (s) may be rejected.**

ii. **If the product offered by vendor, failed to meet the specifications / standards mentioned in the BOQ, it will be rejected straightaway and no further consideration will be given. Also, if the offered product has better specifications than the requirement of BOQ it will be accepted.**

iii. **Vendor is responsible for installation or commissioning of equipment (if required)**

iv. **Purchase / work order (s) will be awarded on Item wise Basis.**

v. **Kindly attach the Tender fee with Technical Bid and Bid money / CDR with Financial Bid.**

vi. **Multiple rates of an item may also lead to the rejection of bid / item.**

Signature & Stamp of Bidder